NUCLEAR INFORMATION AND RESOURCE SERVICE

6930 Carroll Avenue, Suite 340, Takoma Park, MD 20912
301-270-NIRS (301-270-6477); Fax: 301-270-4291
nirsnet@nirs.org; www.nirs.org

The following excerpted material from the identified NRC document reveals significant non-compliance with fire safety regulations promulgated in 1981as a result of the Browns Ferry Unit 1 fire on March 22, 1975.

From NRC Letter dated April 25, 2007 from Eva Brown (NRC Browns Ferry Restart Project Manager) to Preston Swafford (TVA) from the Attachment - NRC Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No 271 to Renewed Facility Operating License NO. DPR-33 Amendment No. 300 to Renewed Facility Operating License

Highlight and emphasis added along with bracketed comments by NIRS.

From the Attachment:

3.1.1 Organization and Staffing [page 4]
"The NRC staff reviewed the Operations staffing requirements needed to support the addition of Unit 1 production. The licensee indicated that staffing was increased to support operation of Units 1, 2 and 3. This increase was primarily to support the interim compensatory measures in place to address identified deficiencies with the safe shutdown methodology. These compensatory measures require the use of significant operator manual actions (OMA) as outlined in the licensee's Safe Shutdown Instructions (SSIs)."

3.1.5 Post Fire Safe Shutdown [page 5-6]
"Paragraph III.G.1 of Appendix R (III.G.1) outlines the performance objectives of the FPP (fire protection plan*) relative to post-fire safe shutdown. The objectives are to ensure that one success path of SSC necessary for hot shutdown is free from fire damage, and to limit fire damage such that one success path of SSC necessary to achieve and maintain cold shutdown can be repaired and made operable within a specified time period using onsite capabilities.*

"The NRC staff observed that various fire areas in the FPR were designated as III.G.1 separation areas [no redundant electrical circuits in same fire zone]. *Regulatory Issue Summary (RIS) 2005-30, Clarification of Post-Fire Safe Shutdown Circuit Regulatory Requirements, indicates that III.G.1 protection for redundant safe shutdown systems may not be claimed for redundant systems in a III.G.2 area by crediting an OMA at an emergency control station. Unless alternative or dedicated shutdown capability is provided, redundant circuits credited for post-fire safe shutdown and located in the same*

fire area must be protected in accordance with III.G.2 without the use of emergency control stations of any kind.

"As stated in RIS 2006-10, Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions:
…if one of the redundant trains in the same fire are is free of fire damage by one of the specified means in paragraph III.G.2 then the use of operator manual actions, or other means necessary, to mitigate fire-induced operation or maloperation to the second train may be considered in accordance with the licensee's fire protection program and license condition since paragraph III.G.2 has been satisfied.

"Manual actions are also permitted when using alternative shutdown in accordance with III.G.3. Therefore, it is the NRC's staff understanding that for a fire area designated as III.G.1, one path of the SSCs remains free from fire damage without crediting an OMA at an emergency station. If not, the provisions of III.G.2 or III.G.3 are applicable and those actions should be addressed consistent with the licensee's April 24, 2006, commitment concerning OMAs. As the licensee has indicated that the Browns Ferry units are in compliance with Appendix R, with the exception of the crediting of manual actions in lieu of separation for identified III.G.2 areas, the NRC staff finds that the FPP (fire protection program) adequately addresses the post-fire performance objectives of III.G.1."

3.1.5 [sic*] Safe Shutdown* [page 6]

"As discussed above paragraph III.G.2 of Appendix R requires that where cables or equipment, including associated circuits that could prevent operation or cause maloperation—as a result of short circuits, open circuits, or shorts to ground---of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside primary containment, a means of ensuring that one of the redundant trains is free from fire damage shall be provided.

"Section 3 of the FPR (TVA's fire protection program) *proposes to use the same safe-shutdown methods utilized in Units 2 and 3. The approved program in the SE* (Safety Evaluations) *dated March 31, 1993 and November 2, 1995, included meeting the separation criteria of Appendix R, paragraph III to ensure that one train of safe shutdown equipment remains free of fire damage. The NRC staff noted that fire areas other than fire area 16 (control building) rely on the use of OMAs to accomplish post-fire safe shutdown, however manual actions in lieu of compliance with paragraph III.G.2 are not allowed without an exemption. A review of fire protection exemptions found that no exemption has been requested by the licensee nor approved by the NRC staff for these manual actions. Therefore, the use of OMA's in lieu of compliance with paragraph III. G.2 is one of the generic issues identified during this review.*

"Another issue concerns how the licensee dealt with spurious operation of components resulting from a postulated fire. The FPR states that:
…fire development is considered to be slow and progressive allowing time to respond to spurious actuations one at a time.

In RIS 2005-30, the NRC staff noted that licensees need to address the potential for concurrent spurious actuations, based on regulatory requirements and on industry test results. In RIS 2004-03, Rev. 1, Risk-Informed Approach for Post-Fire Safe Shutdown Circuit Inspections, the NRC staff provided information concerning the probabilities, given a fire, of certain types of circuit interactions. During the review, the NRC staff noted that the licensee assumptions to address spurious operations for Unit 1 did not conform to NRC guidance."

3.1.5.2 Fire Induced Circuit Failures [page 7-8]

"On September 6, 2006, the NRC extended enforcement discretion related to the disposition of potential non-compliances involving fire induced circuit failure vulnerabilities that have the potential to affect safe shutdown of the facility."

3.1.6 Summary [page 9]

"The NRC staff concludes that the FPP's design criteria and bases are acceptable to meet the requirements of 10 CFR 50.48 and the applicable general design criteria…

"Additionally, the NRC staff concludes that with the exceptions noted in Section 3.1.5 [the Browns Ferry Fire Protection Law governing post-fire safe shutdown requirements] *and 4.0* [Regulatory Commitments], *the design of the BFN* [Browns Ferry Nuclear] *safe-shutdown SSC* [Systems, Structures and Components] *provides reasonable assurance that fuel integrity is maintained (i.e. fuel design limits are not exceeded* [meltdown]."