Nuclear Information and Resource Service
1424 16th Street NW Suite 404
Washington DC 20036
Tel. 202-328-0002 http://www.nirs.org

January 15, 2003

The Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555

By electronic submission

Comments of Nuclear Information and Resource Service (NIRS) on the Voluntary Fire Protection Requirements for Light Water Reactors: Adoption of NFPA 805 as a Risk-Informed, Performance Based Alternative

To the Office of the Secretary:

On behalf of Nuclear Information and Resource Service (NIRS), I am providing comments on issues pertaining to the U.S. Nuclear Regulatory Commission (NRC) adoption of National Fire Protection Association (NFPA) 805 "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition.

The Commercial Nuclear Power Industry Should Be Held to the Highest and Most Stringent Regulatory Standards

According to the US NRC document NUREG-1150, a fire in a nuclear power station is the leading contributor to Core Damage Frequency. The potential radiological consequences of such an accident to life, land and water are unacceptable. Therefore, NIRS contends that the nuclear power industry must be held to the highest standard of fire protection codes. NIRS maintains that such standards for this inherently dangerous industry must necessarily be more deterministic and prescriptive in nature until such time significant uncertainties, including the area of fire modeling, are bounded with a higher degree of demonstrated confidence and acceptance.

The nuclear power industry has a long and detailed history of fire protection problems dating back to the Browns Ferry nuclear power station fire on March 22, 1975 and before. As a result of the safety significance of the Brown's Ferry fire for the commercial nuclear power industry the NRC established 10 CFR 50 Appendix R for prescriptive fire protection programs at nuclear power stations along with other important NRC guidance documents including Branch Technical Position Auxiliary Power Conversion Systems Branch 9.5.1 "Guidance for Fire Protection for Nuclear Power Plants." Within that guidance NRC adopted prescriptive standards for the passive protection of structures,

systems and component important to the post-fire safe shutdown systems. There continues to be recurrent industry-wide compliance problems in such areas as the protection safe shutdown electrical power, instrumentation and control circuitry stemming largely from installed inoperable and unqualified passive fire barrier systems.

NIRS contends that outstanding non-compliance issues with inoperable and unqualified 3-hour and 1-hour passive fire barriers systems for safe shutdown capability are a key factor in the action taken by the proposed alternative approach. NIRS does not believe that the proposed alternative approach constitutes an adequate or equal fire protection system to all nuclear power plants nor does it meet the deterministic/ prescriptive standard as qualified by time-temperature fire tests for a passive fire barrier system on instrumentation, power and control cable trays and conduits dedicated to post fire safe shutdown capability. NIRS maintains that enforceable prescriptive regulatory oversight of fire code compliance is necessary to achieve the necessary high level of confidence in shutting down and safely maintaining the reactor in the event of a significant fire.

NIRS additionally contends that industry cost-cutting is driving an alternative approach to an otherwise more costly corrective action programs to bring licensees into compliance with the deterministic standards. Given large uncertainties in applying a standard based completely or in large part on probabilistic risk assessments NIRS contends that such action constitutes an undue risk to the public health and safety.

Providing the Industry with an Alternative Performance-Based Approach to All or Significant Portions of Deterministic and Prescriptive Language in NFPA 805 Through Risk-Informed and Potentially Risk-Misinformed Activities

NIRS contends that allowing the industry the use of performance-based methods to address NFPA 805 Chapter 3 fundamental elements constitutes an undue and unreasonable risk to public safety.

The Browns Ferry fire is the original and most flagrant example of unanticipated consequences in the testing and maintenance of fire protection systems at nuclear power stations. In this case, the technician checking electrical cable trays for air leaks with a burning candle was risk-misinformed of his activity. NIRS has no confidence that the industry can so thoroughly analyze and evaluate fire protection guidance as to abandon all prescriptive and deterministic language in NFPA 805.

In its effort to broadly justify a performance-based approach over any and all deterministic language in NFPA 805 with particular focus on fire-induced circuit failure issues, the Nuclear Energy Institute has offered the example of on-line maintenance as another "risk-informed" and performance-based activity that can be conducted without reducing safety margins in nuclear power stations. In fact, online maintenance carries an significant and identifiable degree of significant risk. NIRS wishes to point out that recent compensatory actions taken at the Davis-Besse nuclear power station in 2001 and 2002 in an effort to gain NRC approval for an extension of station operations beyond a required unscheduled shutdown for inspection of Control Rod Drive Mechanism Vessel

Head Penetrations before December 31, 2001 per NRC Bulletin 2001-01 included the suspension of its scheduled on-line maintenance activities from November 30, 2001 through February 16, 2002 as a compensatory measure to increase safety at the reactor. FirstEnergy's action to curb its on-line maintenance activities raises the issue of the risk significance of such activities and as such brings into question the example of the assumed risk analysis being used to expand the practice of on-line maintenance.

NIRS further contends that given the large range of uncertainties associated with modeling fire, there is an equally broad range of uncertainty for "risk-informing" and potentially "risk-misinforming" fire models used to justify guidance for Probabilistic Risk Assessment-based alternative fire protection standards.

In another example, the wholesale removal of prescriptive language and requirements in such areas as 3-hour qualified fire barriers and replacing them with an assumed fire resistance rating equal to a so-called "postulated hazard" does not provide an adequate level of confidence or equal protection in that all hazards, including unforeseen transient combustibles, have been bounded by such assumptions.

Security-Related Deterministic and Prescriptive Elements in the Fire Code for Nuclear Power Plants Should Now Be Strengthen to Require Blast Resistant Hardening and Fire Resistant Protection of Reactor Safe Shutdown Circuitry

In light of the clear and present danger posed by the September 11th attacks on the World Trade Center and the Pentagon, NIRS contends that a NRC re-analysis of the issue of fire-induced circuit failure in context of a re-evaluation of the Design Basis Threat requires the most stringent of blast and fire standards to bound the new threats from deliberate sabotage. The broad application of a performance-based standard for fire protection cannot effectively capture deliberate sabotage and therefore does not constitute adequate protection to the health and safety of the public. Therefore, such blast and fire standards should be deterministic and utilize tested and qualified systems.

Significant security and safety-related concerns now arise out of the over-reliance and liberal use of probabilistic risk analysis of blast and fire-induced failure of various structures, systems and components such as circuitry associated with post fire safe shutdown capability.

Under a new and more conservative Design Basis Threat criteria, key safe shutdown systems and circuitry must be identified and physically hardened to reduce the risk of core damage as the result of deliberate sabotage by such means including a high-jacked commercial aircraft and large trucks used to deliver explosive and incendiary bombs. NIRS contends that blast resistant qualified and time-temperature rated passive fire barrier systems are two key deterministic criteria that must be incorporated into safe shutdown circuitry systems as the result of a re-evaluation of the Design Basis Threat.

To date, the nuclear industry and NRC have not adequately analyzed the impact of fuel/air blast and fire on safe shutdown circuitry inside or outside of the containment

resulting from the impact, penetration and detonation of a fully fueled commercial aircraft as repeatedly used on September 11th.

The potential radiological consequences resulting from such an act of sabotage to life, land and water are unacceptable and therefore justify the enforcement of strict deterministic or prescriptive safeguard fire standards employing qualified blast-hardened and fire-resistant protection to safety identified systems, structures and components throughout the reactor complex.

NIRS Opposes the Adoption of NEI 00-01 as a Guidance Methodology Alternative to 10 CFR 50 Appendix R and NFPA-805 for Circuit Failure and Post Fire Safe Shutdown Analysis

Revised Office of Management and Budget Circular A-119, February 10, 1998, establishes policies on the Federal use and development of voluntary consensus standards and on conformity of activities. The revision makes the terminology of the Circular consistent with the National Technology Transfer and Advancement Act of 1995. The policy establishes that for Federal use of standards adopted in voluntary consensus bodies, the voluntary consensus standards body is to be defined by openness, balance of interest, due process, and an appeals process. By such definition, NIRS contends that the alternative approach sought by the Nuclear Energy Institute under its "Generic Guidance for Post-Safe Shutdown Analysis" constitutes a "non-consensus" or "industry standard" and therefore cannot be incorporated into the voluntary consensus standard activity of NFPA 805.

Paul Gunter, Director
Reactor Watchdog Project