



# NRC Management Overview of Fire Protection Issues

Briefing for the NEI Fire Protection  
Information Forum

Suzanne Black, Deputy Director  
Division of Systems Safety and Analysis,  
NRR, USNRC  
301-415-3226

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# Fire Protection - So Many Opportunities

- How We Got to Where We Are
  - Back Fit Following Browns Ferry Fire
  - Prescriptive Regulation
  - Custom Designs/Reviews

# Thoughts on a Better World

- Reduced Uncertainty
- Clear Guidance to Industry and Inspectors
- Flexibility – Without need for NRC review and approval
- Risk Informed and Performance Based (Guidance)
- NFPA 805

# More Thoughts on a Better World

- SDP Timeliness and Clarity
- Ongoing Improvement
- Old Design Issues
- Backfit/Enforcement
- Generic Issues Resolution –  
Through more Effective and  
Efficient processes



# **Current Fire Protection Regulatory Issues**

Briefing for the NEI Fire  
Protection Information  
Forum

Eric Weiss, Chief  
Fire Protection Section,  
NRR, USNRC  
415-3264

# Current Issues

- Risk-Informed Performance-Based Rule to Endorse NFPA 805
- NEI Guidance Document for NFPA 805
- Circuit Analysis
  - NEI 00-01
  - NUREG/CR
- Gaseous Suppression Systems
- Hemyc and MT3

# Current Issues (Continued)

- License Renewal
- Power Upgrades
- Advanced Reactors
- Fire Dynamics Spread Sheet (FDS<sup>2</sup>)
- Manual Actions
- Training of Regional Inspectors
- Heat Collectors



# NRC Views on Manual Actions

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# **NRC Letter to NEI**

## **May 16, 2002** (ML021410026)

- Manual Actions are allowed for:
  - ◆ III.G.1 of App R Equipment in separate fire areas
  - ◆ Normally operated manual switches and valves
  - ◆ By exemption or deviation for III.G.2 of App R
  - ◆ III.G.3 of App R Equipment alternative and dedicated shutdown

# **Appendix R to 10 CFR 50 Section III.G.2**

- 3 hour barrier
- 1 hour barrier with suppression and detection
- 20 feet with no intervening combustibles and suppression and detection

# **NRC/NEI Meeting June 20, 2002**

- NEI contends Manual Actions should be allowed when feasible
- NEI contends that Manual Actions Allowed by reg guidance, safety evaluations, inspections, correspondence and meetings
- NEI presented results of recent survey
- NRC noted that violations should be written when manual actions were not feasible
- NRC does not intend to suspend inspections
- NRC agreed to consider alternatives

# **What NRC Inspectors Look for (When is a Manual Action feasible)**

- Procedures and training for manual actions to be performed
- Thermal-hydraulic timeline or other analysis to show that there is adequate time, staffing, and diagnostic instrumentation to perform manual actions
- Acceptable environmental conditions (temp, radiation, lighting, accessibility)

# Where are we?

- NRC will continue to inspect
- All manual actions must be feasible (in procedures, with supporting analysis, performable)
- Licensees are responsible for safety of their plants
- NRC position in May 16 letter remains unchanged at this time
- NRC is investigating alternatives for permitting feasible manual actions in lieu of current III.G. 2. Provisions- Perhaps rulemaking and Interim Enforcement Policy

# Industry Perspectives

Fred Emerson, NEI

August 29, 2002



# Topics

- Hemyc and MT fire barriers
- Manual actions
- Gaseous suppression





# Hemyc Fire Barriers

## ■ Current status

- NEI assisting users' group in regulatory interactions
- NRC testing
  - ◆ Provided photos of typical plant configurations to NRC
  - ◆ Reviewing NRC test plan







# Manual Actions

## ■ Activities

- 11/01 – NRC guidance for inspector training
- Several inspections
- 1/11/02 – NEI letter stating industry position
- 5/16/02 – NRC response
- 6/20/02 – Meeting with NRC





# Industry Position

The use of manual actions to achieve safe shutdown (both alternate and redundant) is acceptable, without prior NRC approval, as long as the reliance on manual actions does not adversely affect the ability of the plant to achieve and maintain safe shutdown. Licensees should be able to demonstrate that the actions can be carried out in the time frame and under the environmental conditions applicable to the actions.



# Manual Actions

## ■ NEI views

- Licensees should be able to demonstrate the feasibility of carrying out manual actions for both redundant and alternate shutdown
- Licensees should not be cited solely because they have not requested exemptions or deviations



# Manual Actions

- NEI understands that NRC:
  - Substantially concurs with these views
  - Is taking both short-term and long-term action to reflect these views in the regulatory environment



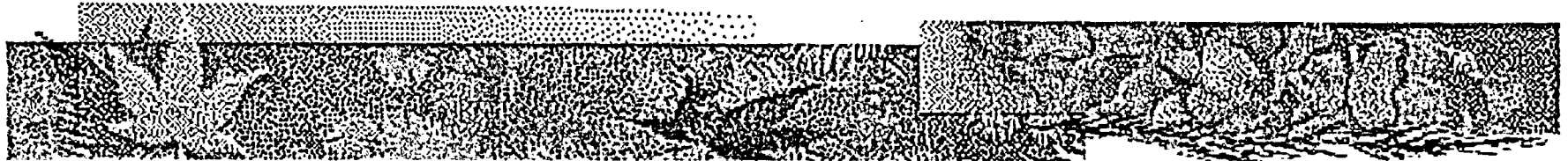


# Gaseous Suppression

- Several inspection issues have arisen related to Halon and CO2 systems
- NEI surveyed plants on use of CO2 and Halon
- NEI plans to address the issue with NRC in the future



# NRC Region I - Fire Protection Inspections



Jim Linville

Electrical Branch Chief

Division of Reactor Safety



# Inspection Status

- 16 of 19 Triennial Team Inspections Complete
- One Finding of Low to Moderate Safety Significance (WHITE)
  - CO<sub>2</sub> Suppression System Performance Issue
  - Coincident With Degraded Raceway Barrier
- 17 Findings were Generally of Very Low Safety Significance (GREEN)

# Summary of Issues


- Time Critical Actions Not Supported With Calculations or Engineering Analyses
  - Time available to restore charging flow before pressurizer level indication is lost
  - Time that an EDG could operate without service water cooling flow
  - Steam generator blow down flow not accounted for when determining time available to recover auxiliary feed water



# Summary of Issues (Continued)


## ■ Procedure Deficiencies

- Availability of support systems not properly addressed
  - For example: instrument air and cooling water
- Required operator actions not included in procedures
- Ability to perform time critical actions not validated
- Inadequate direction to assure use of Auxiliary Spray to transition to cold shutdown
- Inadequate direction to assure de-energizing PORVs to prevent spurious operation



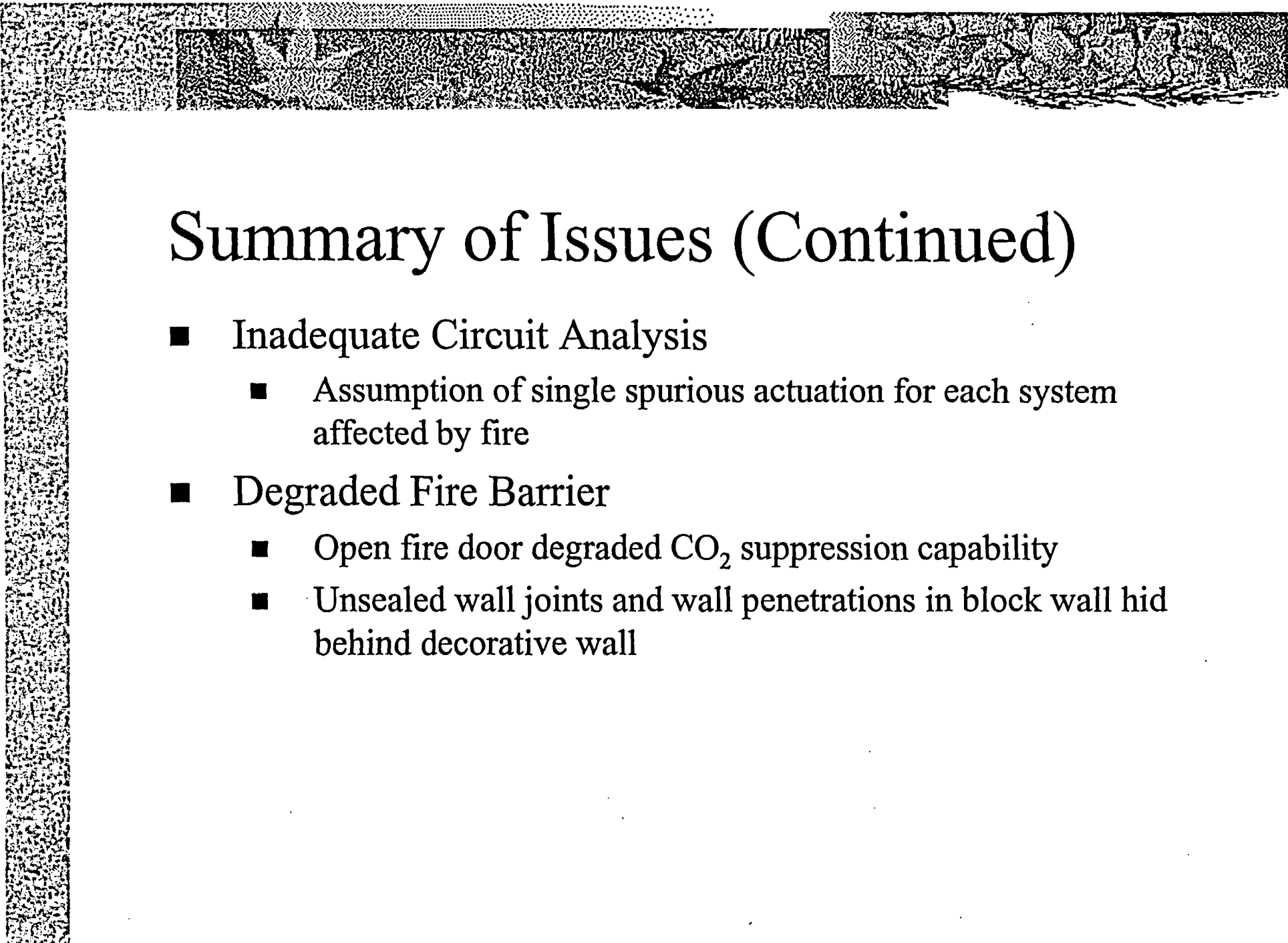
# Summary of Issues (Continued)

- Inadequate Compensatory Measures
  - Compensatory measures for lack of fixed suppression would not have been fully effective-problems would have caused delay
- Suppression System Problems
  - Required CO<sub>2</sub> concentration not achieved during testing
  - Adequacy of CO<sub>2</sub> concentration hold times
  - Over pressurization of room during test
  - Hoses of insufficient length to reach all control room areas



# Summary of Issues (Continued)

- Emergency Lighting
  - Safe shutdown equipment not illuminated
  - Lights mispositioned
- Cable Routing/Raceway Protection
  - Redundant train cabling not separated or protected
  - Alternate shutdown equipment cabling not free of fire area
  - Hemyc raceway fire barrier utilized at several plants – fire test results indeterminate



## Summary of Issues (Continued)

- Inadequate Circuit Analysis
  - Assumption of single spurious actuation for each system affected by fire
- Degraded Fire Barrier
  - Open fire door degraded CO<sub>2</sub> suppression capability
  - Unsealed wall joints and wall penetrations in block wall hid behind decorative wall