Joseph M. Farley Nuclear Plant

Appendix R Status and Elimination of Reliance on Kaowool Fire Barriers for the Service Water Intake Structure (SWIS)

Mike Stinson
General Manager
Farley Nuclear Support
July 25, 2003

SOUTHERN COMPANY
Energy to Serve Your World®

Enclosure 2

Agenda

1. Introduction & Purpose
2. Appendix R Overview
   - Current exemption for the SWIS
   - Background information
3. Basis for the New SWIS Exemption
   - Deterministic and risk-informed performance-based approaches
   - Application of risk-informed performance-based methodology
   - Change evaluation process
   - Assessments
4. Summary

Introduction & Purpose

- Discuss status of Farley's Kaowool issues
- Discuss SNC's application of risk-informed performance-based methodology for the Farley SWIS Appendix R 10 CFR 50.12 exemption
- Receive feedback from the NRC on the proposed approach

Appendix R Overview

Doug McKinney
Farley Licensing Manager

Background Information

- Kaowool related Appendix R exemption requests for Plant Farley were approved by the NRC during 1985 and 1986
- The 1986 exemption for the SWIS relied on Kaowool for protection of several cables
- On August 26, 1999, the NRC informed Farley that qualification tests did not demonstrate that Kaowool met regulatory requirements

Background Information (cont.)

- SNC re-evaluated the Appendix R program
- SNC planned modifications to eliminate dependence on Kaowool
  - 5 modifications completed
  - 27 modifications scheduled to be completed by the end of the spring 2006 outage
- SNC will change licensing documents

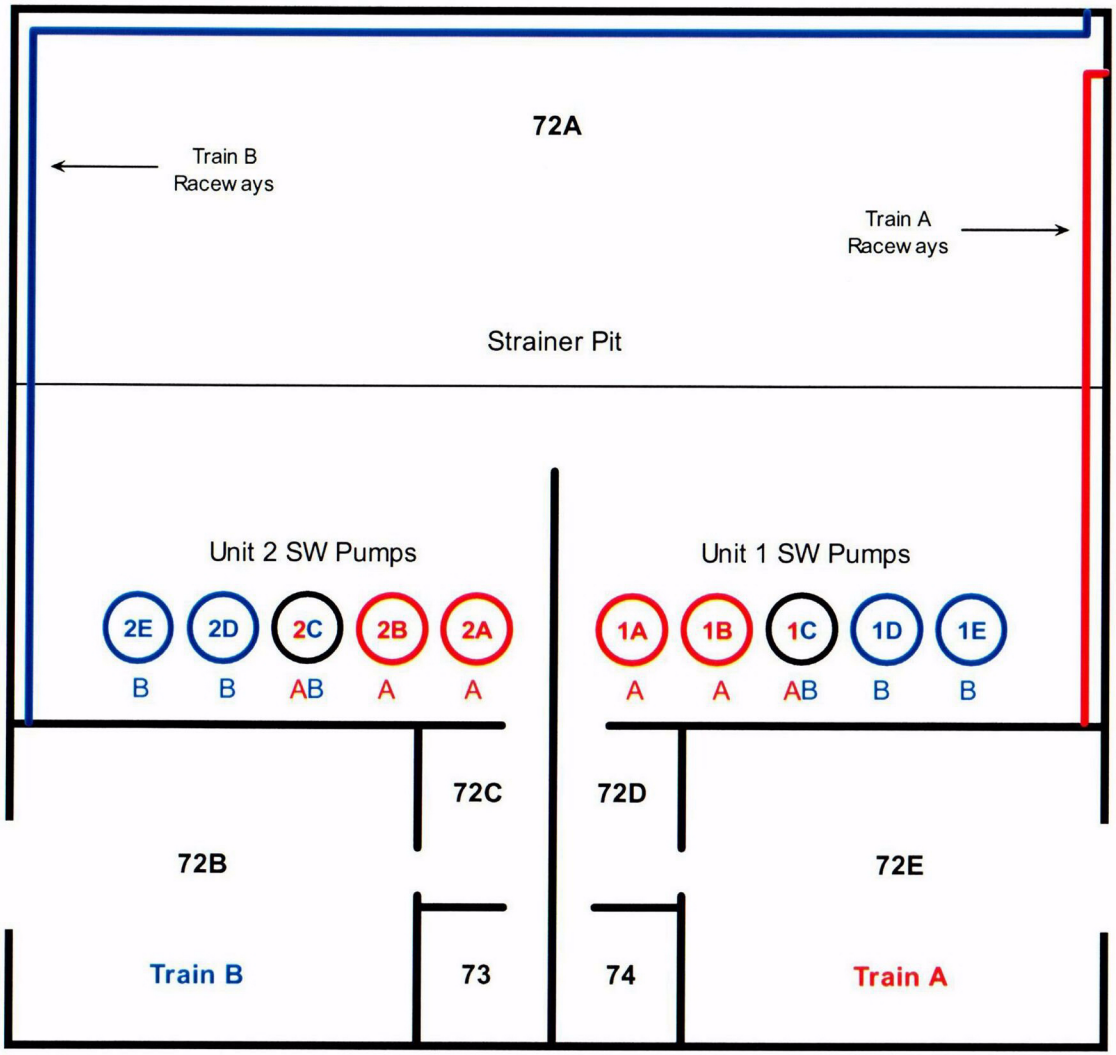
For the SWIS, three options were identified

1. Comply with the Current Licensing Basis
2. Install alternate seal injection pump and reroute cables
3. Determine whether a risk-informed performance-based evaluation would justify not relying on Kaowool

Background Information (cont.)

- A risk-informed performance-based pilot study was completed
- SNC discussed proposed risk-informed performance-based exemption approach in previous meeting with the NRC
- A confirming risk-informed performance-based analysis was completed
- SNC plans modifications and new SWIS exemption

SWIS Plan View - Existing



Legend

Zone 72A - SW Pump Deck and Strainer Pit
Zone 72B - Switchgear Room - Train B
Zone 72C - 5kV Disconnect Switch - Train B
Zone 72D - 5kV Disconnect Switch - Train A
Zone 72E - Switchgear Room - Train A
Zone 73 - Battery Room - Train B
Zone 74 - Battery Room - Train A

Train A

Train B

CO1

Current Exemption for the SWIS

Five of eleven specific configurations rely in part on Kaowool for exemptions from Section III.G.2 requirements:

- U1 Train A cables for Strainer Pit MOVs
- U2 Train A cables for Strainer Pit MOVs
- U2 Train A raceways for certain lube and cooling water pump cables
- Power cables to pumps
- Train A / Train B raceways in northeast corner

Basis for the New SWIS Exemption

Doug McKinney

Farley Licensing Manager

Deterministic Approach

- Modifications
- Deterministic reanalysis, confirming no spurious operation
- Creation of new fire areas
- One SW pump for fire scenario

Risk-Informed Performance-Based Approach

- Evaluated power cables to SW pumps
- Evaluated cable raceways in NE corner

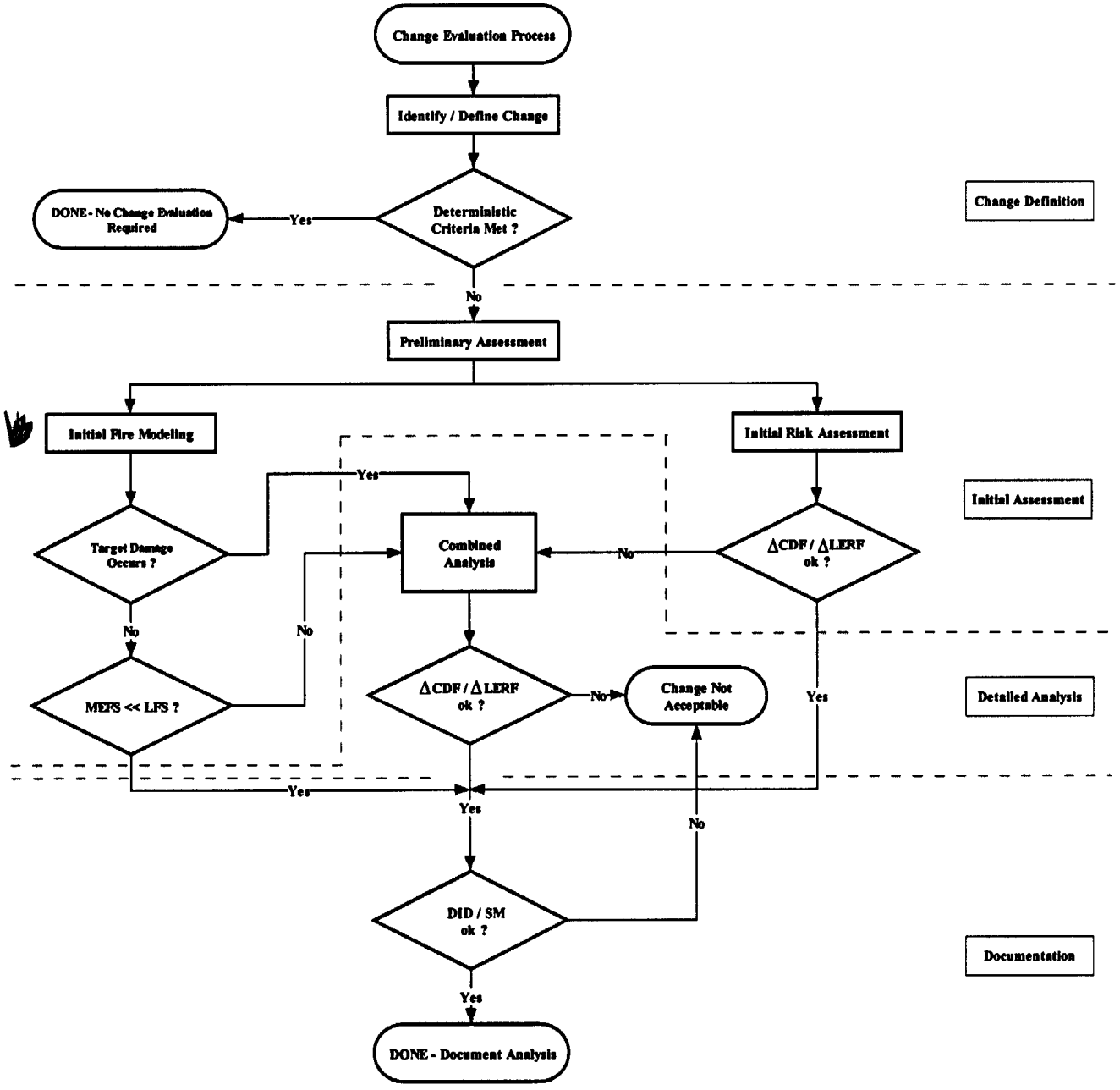
Application of Risk-Informed Performance-Based Methodology

- Support 10 CFR 50.12 exemption
- Based on RG 1.174 criteria
- Draft Section 8.3 of NEI Implementation Guide for NFPA 805

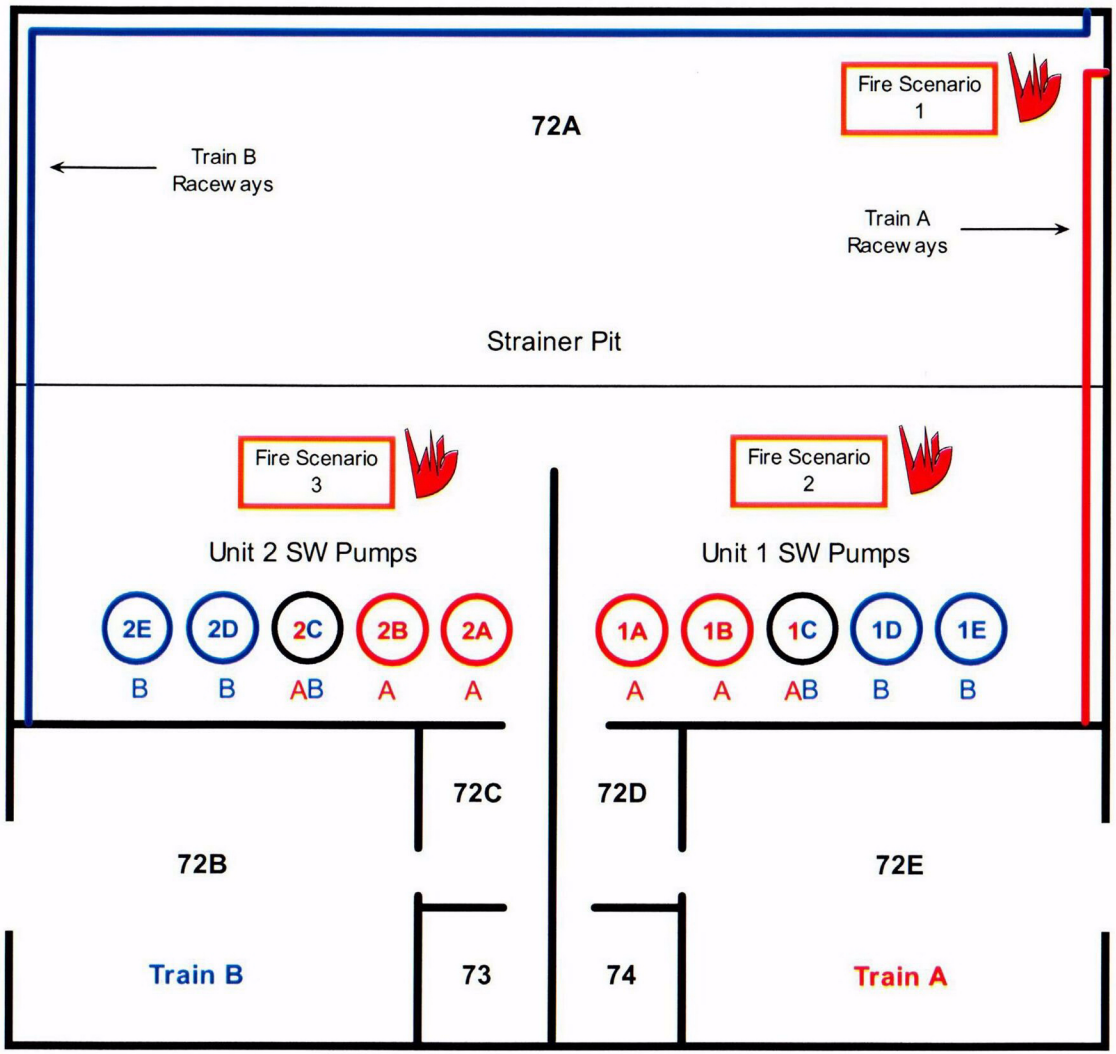
Change Evaluation Process

The Change Evaluation Process consisted of four major parts:

- Change Definition
- Initial Assessment
- Detailed Analysis
- Documentation


Change Evaluation Process
Identify / Define Change
Deterministic Criteria Met ?
Yes
DONE - No Change Evaluation Required
Change Definition
No
Preliminary Assessment
Initial Fire Modeling
Initial Risk Assessment
Initial Assessment
Target Damage Occurs ?
Yes
Combined Analysis
No
ΔCDF / ΔLERF ok ?
No
No
MEFS << LFS ?
ΔCDF / ΔLERF ok ?
No
Change Not Acceptable
Yes
Detailed Analysis
Yes
Yes
Yes
No
DID / SM ok ?
Documentation
Yes
DONE - Document Analysis

Preliminary Assessment – Initial Fire Modeling



Legend

Zone 72A - SW Pump Deck and Strainer Pit
Zone 72B - Switchgear Room - Train B
Zone 72C - 5kV Disconnect Switch - Train B
Zone 72D - 5kV Disconnect Switch - Train A
Zone 72E - Switchgear Room - Train A
Zone 73 - Battery Room - Train B
Zone 74 - Battery Room - Train A

Train A

Train B

CDZ

Preliminary Assessment – Initial Risk Assessment

Determined that combined analysis was required for SW pumps

Combined Analysis

- Fire modeling
  - One SW pump remains operable
- Fire risk analysis
  - CDF determined for one SW pump
  - RG 1.174 criteria met for SWIS
- Defense-In-Depth

  Elimination of dependence on Kaowool meets NFPA 805 criteria to
  - Prevent fires from starting
  - Detect fires quickly and suppressing those that occur
  - Provide protection for systems and structures so that safe shutdown can be achieved
- Safety Margin
  - NRC criteria met

Summary

- Continue modifications – complete in 2006
- SWIS
  - Current licensing bases changes
  - Exemption based on risk-informed performance-based methodology
- New exemption will be submitted to NRC
- NRC feedback