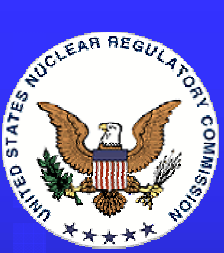




# Treatment of RISC-3 Electrical Equipment Based on Risk Significance For Qualification

IEEE SC-2 Meeting

April 21-22, 2003, New Orleans  
Paul Shemanski, NRC Consultant  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission



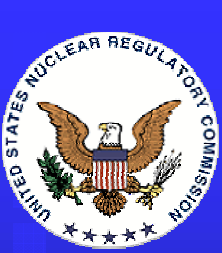
# What Is 10 CFR 50.69?

- **AN ALTERNATIVE APPROACH FOR ESTABLISHING THE REQUIREMENTS FOR TREATMENT OF STRUCTURES , SYSTEMS, AND COMPONENTS (SSCs) FOR NUCLEAR POWER REACTORS USING A RISK-INFORMED METHOD OF CATEGORIZING SSCs ACCORDING TO THEIR SAFETY SIGNIFICANCE.**



# What Is 10 CFR 50.69?

- **THE PROPOSED RULE WOULD PERMIT LICENSEES TO REMOVE SSCs OF LOW SAFETY SIGNIFICANCE FROM THE SCOPE OF CERTAIN IDENTIFIED SPECIAL TREATMENT REQUIREMENTS AND REVISE REQUIREMENTS FOR SSCS OF GREATER SAFETY SIGNIFICANCE.**



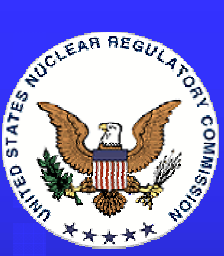
# What Is 10 CFR 50.69?

- **“SPECIAL TREATMENT” REFERS TO THOSE REQUIREMENTS THAT PROVIDE INCREASED ASSURANCE (BEYOND NORMAL INDUSTRIAL PRACTICES) THAT SSCs PERFORM THEIR DESIGN BASIS FUNCTIONS. FOR EXAMPLE, 10 CFR 50.49 IS ONE OF THE EXISTING SPECIAL TREATMENT REQUIREMENTS FOR EQ THAT IS BASED ON A “DETERMINISTIC” APPROACH.**



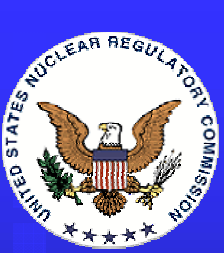
# What Is 10 CFR 50.69?

- **A PROBABILISTIC APPROACH TO REGULATION ENHANCES AND EXTENDS THE TRADITIONAL DETERMINISTIC APPROACH BY ALLOWING CONSIDERATION OF A BROADER SET OF POTENTIAL CHALLENGES TO SAFETY, PROVIDING A LOGICAL MEANS FOR PRIORITIZING THESE CHALLENGES BASED ON SAFETY SIGNIFICANCE.**



# Risk Informed Decision Making Reg. Guide 1.174

- **BE CONSISTENT WITH THE DEFENSE-IN-DEPTH PHILOSOPHY**
- **MAINTAIN SUFFICIENT SAFETY MARGINS**
- **ANY CHANGES ALLOWED MUST RESULT IN ONLY A SMALL INCREASE IN CORE DAMAGE FREQUENCY OR RISK, CONSISTENT WITH THE INTENT OF THE COMMISSION'S SAFETY GOAL POLICY STATEMENT; AND**
- **INCORPORATE MONITORING AND PERFORMANCE MEASUREMENT STRATEGIES**

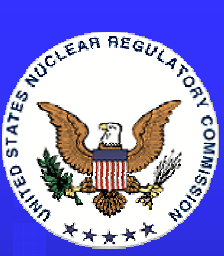


# Risk-Informed Categorization For SCCs

**Risk Informed** ↑  
↓

1 “RISC-1” SCCs  Safety Related Safety Significant	2 “RISC-2” SCCs  Nonsafety Related Safety Significant
3 “RISC-3” SSCs  Safety Related Low Safety Significant	4 “RISC-4” SSCs  Non Safety Related Low Safety Significant

← **Deterministic** →



# RISC-3 SCCs High Level Treatment Requirements

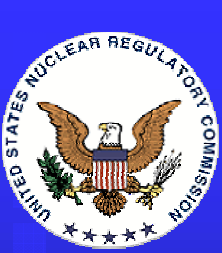
- **FOUR PROCESSES MUST BE CONTROLLED AND ACCOMPLISHED FOR RISC-3 SSCs**
  - ◆ **DESIGN CONTROL**
  - ◆ **PROCUREMENT**
  - ◆ **MAINTENANCE, INSPECTION, TESTING, AND SURVEILLANCE**
  - ◆ **CORRECTIVE ACTION**





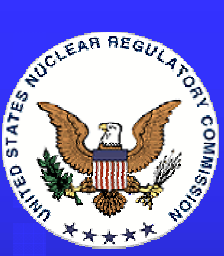
# RISC-3

- **WHEN RISC-3 SSCs ARE REPLACED, THEY MUST REMAIN CAPABLE OF PERFORMING DESIGN BASIS FUNCTIONS.**
- **WHEN DATA ARE COLLECTED, THEY MUST BE FED BACK INTO THE CATEGORIZATION AND TREATMENT PROCESSES, AND WHEN IMPORTANT DEFICIENCIES ARE FOUND, THEY MUST BE CORRECTED.**
- **EFFECTIVE IMPLEMENTATION OF THE ABOVE TREATMENT REQUIREMENTS PROVIDES REASONABLE CONFIDENCE IN THE CAPABILITY OF RISC-3 SSCs TO PERFORM THEIR SAFETY FUNCTION UNDER NORMAL AND DESIGN BASIS CONDITIONS.**



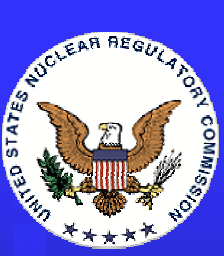
# Design Control

- **MUST HAVE A DOCUMENTED BASIS TO DEMONSTRATE CAPABILITY OF PERFORMING SAFETY-RELATED FUNCTIONS INCLUDING DESIGN REQUIREMENTS FOR ENVIRONMENTAL CONDITIONS (i.e., TEMPERATURE & PRESSURE, HUMIDITY, CHEMICAL EFFECTS, RADIATION & SUBMERSION) AND EFFECTS (i.e., AGING & SYNERGISM).**



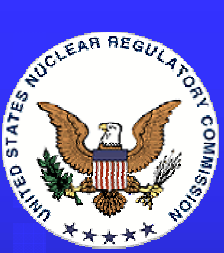
# Procurement

- **ITEMS PROCURED MUST SATISFY DESIGN REQUIREMENTS AND UPON RECEIPT, LICENSEE MUST VERIFY THAT THE ITEM RECEIVED IS THE ITEM THAT WAS ORDERED.**



# MAINTENANCE, INSPECTION, TESTING & SURVEILLANCE

- **PERIODIC MAINTENANCE, INSPECTION, TESTING, AND SURVEILLANCE ACTIVITIES MUST BE ESTABLISHED AND CONDUCTED USING PRESCRIBED ACCEPTANCE CRITERIA AND THE RESULTS EVALUATED TO DETERMINE THAT THE RISC-3 SSCs WILL REMAIN CAPABLE OF PERFORMING THEIR SAFETY-RELATED FUNCTIONS UNDER DESIGN BASIS CONDITIONS UNTIL THE NEXT SCHEDULED ACTIVITY.**



# Corrective Action

- **CONDITIONS THAT COULD PREVENT SSCs FROM PERFORMING SAFETY-RELATED FUNCTIONS UNDER DESIGN BASIS CONDITIONS MUST BE IDENTIFIED, DOCUMENTED, AND CORRECTED IN A TIMELY MANNER. MEASURES SHALL BE TAKEN TO PRECLUDE REPETITION OF SIGNIFICANT CONDITIONS ADVERSE TO QUALITY.**



# Current Status

- **PROPOSED 50.69 PUBLISHED FOR COMMENT - 5/16/03**
- **PUBLIC COMMENT PERIOD CLOSED - 8/30/03**
- **ACRS SUBCOMMITTEE ON RELIABILITY & PROBABILISTIC RISK ASSESSMENT WAS BRIEFED ON 2/19/04 ON SIGNIFICANT TECHNICAL ISSUES THAT MUST BE ADDRESSED TO PUBLISH A FINAL 50.69 RULE.**
- **REVIEW AND RESOLUTION OF PUBLIC COMMENTS, DRAFT REVISION D OF NEI 00-04 AND REVISION TO DG-1121 ARE ONGOING TASKS.**
- **FINAL RULEMAKING PACKAGE DUE TO THE COMMISSION 6/30/04.**