

Draft ISG-10  
Justification for the Minimum  
Margin of Subcriticality (MoS)  
For Safety

Christopher S. Tripp, Senior Nuclear Process Engineer  
U.S. Nuclear Regulatory Commission  
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Enclosure 3j

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# Motivation for Draft ISG-10

- Need for documented consistent regulatory approach
- Poor NRC documented technical basis for approval
- Increasing challenges to MoS:
- Increased reliance on computer calculations of  $k_{\text{eff}}$
- Reduced conservatism in explicit modeling
- Increased interest in reducing MoS
- Expansion to new facilities, processes, areas of applicability
- Difficulty/inefficiency in recent licensing actions

# Motivation for Draft ISG-10 (cont.)

- MoS safety-significant:
  - Allowance for unknown uncertainties in calculations
  - Perfect knowledge not possible (lack of benchmarks)
  - Represents degree of confidence in subcriticality
  - Small changes in validation (benchmarks, methods) can have significant effect on USL
- Addresses lack of existing standards guidance
- Need agreed to at July 2004 workshop

# Purpose of Draft ISG-10

- Provide a basis for evaluating MoS that:
  - Is systematic and consistently applied
  - Is risk-informed
  - Takes facility/process-specific considerations into account
- Provide guidance on *some acceptable ways* to provide adequate assurance of subcriticality
- Facilitate more efficient license review

# Approach of Draft ISG-10

- Presents 5 criteria that *may* be used to justify MoS (may use any or all):
  - Benchmark similarity
  - System sensitivity
  - Knowledge of neutron physics
  - Rigor of validation methodology
  - Margin in system parameters
- Provides guidance on several possible ways to meet criteria
- Use of other appropriate justification allowed

# Summary of Comments Received

- Inclusion of specific MoS values
- Imposition of new regulatory requirements
- Emphasis on  $k_{\text{eff}}$  as indicator of safety
- Emphasis on use of specific codes (TSUNAMI)
- Replacement of existing ANSI guidance

# Status

- NRC actively reviewing comments received
- Comments will be considered as NRC seeks to finalize ISG-10