



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 17, 2001

MEMORANDUM TO: David B. Matthews, Director  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation *David B. Matthews*

THRU: William D. Beckner, Chief  
Technical Specifications Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

FROM: Robert L. Dennig, Section Chief  
Content and Applications Section  
Technical Specifications Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation *Robert L. Dennig*

SUBJECT: REPORT ON COMBUSTION ENGINEERING OWNERS GROUP  
(CEOG) PROBABILISTIC SAFETY ASSESSMENT (PSA) COMMITTEE  
MEETING AT PALISADES PLANT ON AUGUST 16 AND 17, 2001

Attached is the meeting summary of the meeting with the CEOG PSA Committee and the Nuclear Energy Institute on Risk Informed Technical specifications.

Attachments: As stated

CONTACT:  
Robert T. Tadjer, NRR-RTSB  
301-415-1187

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DATE	09/17/2001	09/17/2001	09/17/2001	

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## **SUMMARY OF THE AUGUST 16 & 17, 2001, NRC MEETING WITH THE COMBUSTION ENGINEERING OWNERS GROUP (CEOG) AND NEI ON RISK-INFORMED TECHNICAL SPECIFICATION INITIATIVES**

The NRC staff met with the CEOG Probabilistic Safety Assessment Subcommittee and NEI to discuss the Risk-Informed Technical Specification (RITS) Initiatives, on August 15 and 16, 2001. The meeting attendees are listed in attachment 2.

The central discussions of the meeting were on the RITS initiatives in which CEOG effort was being focused, primarily Initiative 4 on development of flexible AOTs. Following is a brief description of the discussions of the meeting.

### **Initiative 4, Risk Informed AOTs, use of a configuration risk management program (CRMP):**

The proposal involves a combination of the current TS AOTs, an (a)(4) risk assessment to determine AOT extension feasibility, and AOT backstop limits. The handouts provided by the CEOG to discuss this topic are included in attachment 3. The AOT backstop limits ensure that low risk safety functions are not permitted to be inoperable for an indefinite period of time; that a defacto design basis change is not accomplished. A proposed risk assessment process for determining the appropriate AOT was discussed. CEOG intended to present a pilot or strawman proposal involving one system (HPSI) to prove the risk assessment concept involved Initiative 4, and to gain greater understanding of the process. Bob Dennig of NRR/RTSB suggested that more than one system be included in the pilot, and that a support system (such as a system with an electrical specification) be included to better appreciate what was being proposed. Also, it was suggested that, if possible, all vendor types be included in the pilot. NEI is going to take the lead in organizing further discussion of a unified approach and any associated submittals.

PRA Quality/PRA Benchmarking was discussed as a corollary to adoption of the risk assessment process for AOT determination. For example, it is expected that plants with more robust PRAs could, in general, be able to justify longer AOTs than plants with poorer PRAs. Peer assessments of PRAs is vital activity in the process of adopting risk informed techniques for managing risk. Some plants can opt for pre-analyzed plant configurations as part of their risk analysis, rather than using online PRAs. CEOG handouts on PRA Quality are provided in attachment 4.

The other Risk Informed initiatives were briefly discussed, and a synopsis of the discussions are provided below.

**Initiative 2, TSTF-358, Missed Surveillance Requirements (SR), SR 3.0.3 modifications:** The NRC staff issued the Federal Register Notice (FRN) presenting the proposed TSTF-358 and associated Safety Evaluation (SE) for comment. The comments have been received and are currently being addressed. A synopsis of the comments was discussed.

**Initiative 1, TS Actions End States Modifications:** NRC staff review of the industry topicals supporting this initiative have begun. The CE topical SER was issued on July 17, 2001. The BWR topical SER is in review and RAIs were issued on July 30, 2001. The industry is reviewing both the CE topical SER and the BWR topical RAIs. RTSB will review and comment on CEOG's and BWROG's two different approaches to translating the topical report details into

actual technical specification (TS) changes. In brief, the BWROG included changes to TS 3.0.3 end states (related to Initiative 6) and reactor pressure end states, which CEOG did not address. Also, in some TS the BWROG added additional Conditions.

**Initiative 6, Modification of LCO 3.0.3 Actions and Completion Times:** A CEOG submittal (on 6b/c) was received on January 24, 2001, and staff review has begun. RAIs were issued on May 9, 2001. The CEOG is working on RAI responses.

**Initiative 3, TSTF-359, Modification of mode restraint requirements of LCO 3.0.4:** The staff review of TSTF-359 has begun. The staff presented RAIs related to TSTF-359. The most significant area of confusion was related to the referral to risk assessments. TSTF-359 is based upon three types of risk assessment, which are not explicitly presented: the first assessment is the maintenance rule (a)(4) required risk assessments, which essentially encompasses all of the mode changes with system LCOs not fully met (emergent conditions); the second assessment is the generic assessment included in the TSTF-359 submittal that exempts systems from LCO 3.0.4 requirements, without further need for specific plant condition assessments; and, the third assessment is the plant condition specific assessment for the systems that might manifest significant risk. The industry plans to rewrite TSTF-359 to enhance its clarity.

**Initiative 7, Non-TS support system impact on TS operability determinations:** Initiative 7 is a special case subset of Initiative 4, in which TS system inoperability is the result of an inoperable support system that is required for a very low frequency event. It is now expected that a TS 3.0.8 will initially be proposed to address only snubbers, and that TS 3.0.8 will be superseded to generically address both snubbers and other specific support systems. Industry is working on Initiative 7 proposals. It is possible that Initiative 4 will eventually encompass Initiative 7.

The industry proposal to increase the time between the performances of the Containment Integrated Leak Rate Test (ILRT), from 10 to 20 years, was also discussed.

**NRC MEETING WITH CEOG/NEI ON THE  
RISK-INFORMED TECHNICAL SPECIFICATION INITIATIVES  
ATTENDANCE LIST  
AUGUST 16 AND 17, 2001**

<u>NAME</u>	<u>AFFILIATION</u>
BIFF BRADLEY	NUCLEAR ENERGY INSTITUTE
ALAN HACKROTT	OPPD/CEOG
PAUL HIJECK	<u>W</u> /CEOG
DAVID FINNICUM	<u>W</u> /PSA
BOB WHITE	PALISADES
GARY CHUNG	SCE/SONGS
BOB LINDQUIST	PALO VERDE
BRUCE MROWCA	CCNPP
HOWARD BRODT	ENTERGY-WATERFORD 3
MIKE LLOYD	ENTERGY-ANO
ALBERT CHYRA	DOMINION-MILLSTONE 2
RAY SCHNEIDER	<u>W</u>
BOB DENNIG	NRC/NRR/DRIP/RTSB
BOB TJADER	NRC/NRR/DRIP/RTSB
MARK RUBIN	NRC/NRR/DSSA/SPSB
NICK SALTOS	NRC/NRR/DSSA/SPSB
MILLARD WOHL	NRC/NRR/DSSA/SPSB

**DEVELOPMENT AND IMPLEMENTATION OF  
A FLEXIBLE AOT**

August 2001

**GEOR** GENERAL ELECTRIC ORGANIZATION RESEARCH GROUP

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**Goal of Risk-Informed Technical Specifications**

- Use Risk Informed Strategies to Adjust Technical Specification in order to establish a safe haven for plant operation
  - No changes to 10CFR50.36
  - Remove shutdown as a punitive action
  - Integrate Maintenance Rule, Tech Spec Actions and Risk Informed Decision Making (RIDM) to:
    - prioritize plant activities
    - select appropriate action
    - control plant risk to acceptable levels
  - Drive plant to the appropriate end-state and action

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**Risk Informed TS Effort**

- Several Issues are bundled in this Overall Effort. Goal is to establish a RI approach to control plant configuration and maintenance and reduce impact of TS by making them consistent with RIDM.
- Mode End State Change
  - Missed Surveillance Treatment
  - Relaxation of Mode Restraints
  - Replacement of AOTs with A4 based Action Statements (Initiative 4B)
  - Move STI to admin control and allow RI extensions
  - 3.03 Changes and 3.0.3 Avoidance
  - Redefine OPERABLE

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### Goals of Initiative 4B

- Develop a Risk - Informed Flexible AOT structure that:
  - Maintain general TS structure
  - Is integrated with Maintenance Rule (a)(4)
  - May be implemented by plants with robust (a)(4) programs
    - graded implementation approach
    - flexibility commensurate with capability

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### Concept

- Identify high risk operational considerations which may require expedited plant shutdown.
- Develop a Risk Informed Shutdown Decision Process
- Provide a lower limit AOT
- Use Maintenance Rule Process to control outage time
- Define Backstop AOTs for extended repairs
- Use of Flexible AOT tracked via MR targets and Oversight Process

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### Bases for Concept

- The proposed concept attempts to maintain several features that exist within the current TS
  - High risk conditions are identified and dealt with promptly
  - A period to complete the repair and return the plant to the DB configuration is defined
  - Shutdown of the plant may be a required outcome of the process
  - Controlled via MR and Oversight process

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**Use of Backstop**

- Backstop AOT should reflect low risk usage of TS LCO.
  - For Example: One SI valve OOS may result in declared INOPERABILITY of the HPSI train with minimal risk. Thus extended time could be used if needed. However, 1 SI train completely inoperable would not be expected to take advantage of full backup AOT.
  - 10CFR50.59 defines permanent change as 90 days
  - Initiative 4 B will likely recommend 30 days
    - sufficient time for most all component repairs/replacements
    - provides adequate time for alternatives

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**Use of Flexible AOT tracked via MR targets and Oversight Process**

- Maintenance Rule Performance Criteria
- Oversight Process Regulatory Risk associated with unknown configurations. Metric will drive plant to keep operation in the GREEN range.
- Individual system availability PMs may also control actions
- NRC needs to understand that sufficient regulatory controls exist to ensure plant safety is maintained

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**Long Term Vision of a R-I TS**

- Required Actions (time to repair, repair mode, etc) driven by CRMP (A4) RIDM process
- Increase flexibility in definition to allow partial functionality and alternative risks to be considered in RIDM
- High risk actions outside of known/analyzed conditions addressed within RIDM process
- Early risk assessment emphasizes identification and treatment of common cause

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### CEOG Pilot

- Use HPSI AOT extension to Provide focused pilot for Initiative 4B
  - Establishes proof of concept
  - High risk system with some low risk states
  - Easy to demonstrate control and plant status
  - Philosophy already discussed with NRC

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### CEOG Pilot

- Pilot will consider and address
  - Philosophy of change
  - Nexus to (a)(4)
  - Role of PSA "quality"
  - Identify utility pre-requisites for implementation
  - Identify Implementation Options (Risk Matrix vs. Robust Monitor)
  - Example TS changes and expected example usages
  - Modified MR actions to be identified in Appendix
  - Include Industry Draft TS

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### CEOG Pilot

- Questions
  - Use of existing vs. upgraded analyses, key plants
  - Any new experiences to include in data base/need discussion
  - Extent of industry review of A4 "enhancements" and submittal
  - Value of numbers in "enhanced process"
  - Schedule
    - Submittal planned for fall
  - Process validation
    - exercises vs inspection
  - Implementation
    - single AOT or complete set later

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### Future

- Draft report to address Initiative 4B in progress.
- Fast submittal provides a concept on the table so that more detailed discussion may be held
- Once process is agreed to and TS philosophy is defined more global application will be likely.



### Prerequisites for Future Vision

- To maximally partake in the new vision a utility must be committed to an AI program with use of PSA and RIDM process.
  - Robust PSA
  - Process to efficiently establish risk informed decisions
  - Consideration of all plant risks including dominant external events
  - Effective means of addressing current plant conditions



### Summary

- Proposed program increases plant safety and reduces potential for unnecessary plant shutdowns and inappropriate violations
- Phased and graded aspects of risk provides timely benefit for the entire industry.
- Program is Win-Win Utility payback is large (millions dollars per year) provides industry with local control, reduces unnecessary regulation and enhances public safety.



**CEOG Approach to PSA Quality and Quality Applications**

**Task 1164**  
August 2001

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**Task Status**

- Report represents a unique CEOG capstone for PSA quality
- Final Report Issued in March
- Information provided to NRC but not formally documented
- Report used to support CEOG applications

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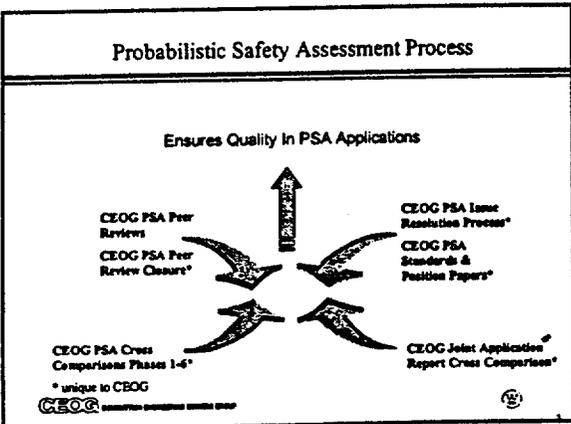
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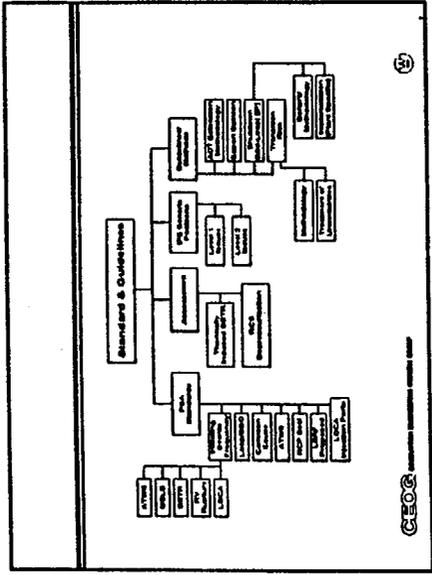
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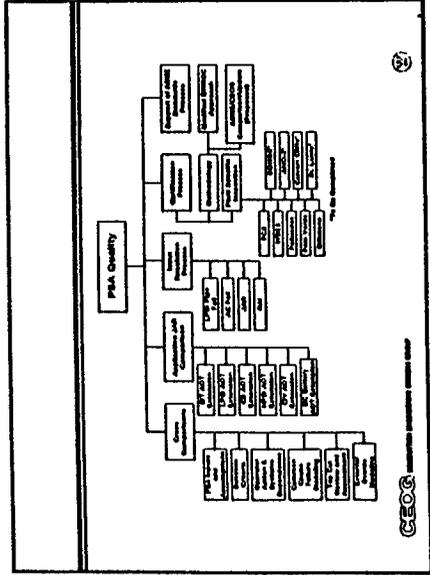
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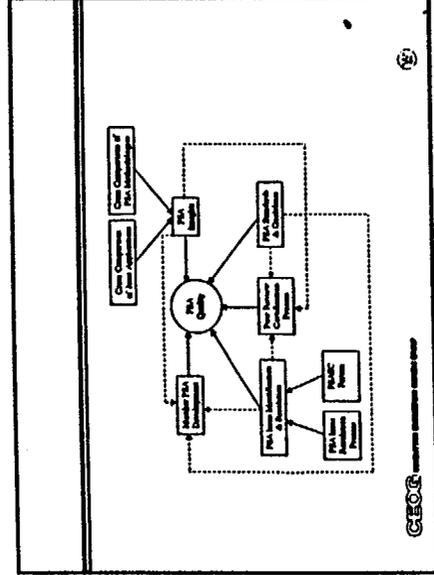
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**PSA Comparisons**

Task 2025

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**CEOR History of Cross Comparisons**

- Cross Comparison Tasks initiated in 1995
- Cross Comparisons looks at detailed PSA aspects from several directions
  - CDF, LERF
  - CDF (per event)
  - Conditional core damage frequency
  - Data Comparisons
    - IEF, reliability data
  - Assumptions
    - treatment of common cause
    - success criteria
    - treatment of human factors
  - Cutset comparisons

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**Lessons Learned**

- Comparisons are useful in identifying
  - impact of conservative modeling approaches
  - impact of plant uniquenesses
  - importance of key assumptions
  - benefits of potential model improvements
- Cross comparisons used a partial measure of quality in early applications. Small variability and bounded impacts across the fleet suggest the adequacy of a generic decision.
- Comparisons lead to modeling changes and standards

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Typical Comparisons
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Typical Comparisons
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CEOG PSA Comparisons
<ul style="list-style-type: none"> <li>• Questionnaire not yet issued               <ul style="list-style-type: none"> <li>- will be modified version of NEI</li> <li>- additional detail and consistency needed in reporting of initiating events</li> <li>- added information on key assumptions and success criteria will be collected</li> </ul> </li>   <li>• From a preliminary look of new data most CE plants have CDF in the <math>2-4 \times 10^{-6}</math> /year range.               <ul style="list-style-type: none"> <li>- One outlier due to temporary conservatism taken in model (issues being addressed)</li> </ul> </li>   <li>• NEI responses will be used to focused CE Request. Duplication will be minimized.</li> </ul> <div style="display: flex; justify-content: space-between; align-items: flex-end; padding: 5px;">   </div>

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### PSA Comparisons

- Task Schedule
  - CEOG data request to be issued early September
  - Data collection to be complete mid-October
  - Draft report to be prepared by November 10.
  - Member review by December 10
  - Report issued by December 31
  
- CEOG Report will highlight the impact of key plant differences on PSA results and place results in a proper prospective for use by an interested third party.



CEOG CONSULTING ENGINEERS GROUP



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