



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

June 7, 2005

MEMORANDUM TO: G. Apostolakis, Chairman, Reliability and PRA Subcommittee
J. D. Sieber, Chairman, Plant Operations Subcommittee

FROM: Michael Snodderly, Senior Staff Engineer, ACRS /RA/

SUBJECT: STATUS REPORT FOR THE JOINT MEETING OF THE
SUBCOMMITTEES ON RELIABILITY AND PROBABILISTIC RISK
ASSESSMENT AND ON PLANT OPERATIONS REGARDING RISK
MANAGEMENT TECHNICAL SPECIFICATIONS, INITIATIVE 4b ON
JUNE 15, 2005, IN ROCKVILLE, MARYLAND

The purpose of this memorandum is to forward background materials for your use in preparing for the upcoming Reliability and Probabilistic Risk Assessment (PRA)/Plant Operations Subcommittee joint meeting scheduled Wednesday, June 15, 2005. The purpose of the meeting is to discuss the status of the development of risk management technical specifications. Attached please find the agenda, status report, and background materials.

Attendance by the following members and consultants is anticipated and reservations have been made at the following hotels for June 14 - 16, 2005, as indicated:

Apostolakis	Residence Inn	Kress	Residence Inn
Bonaca	Residence Inn	Shack	Residence Inn

Please notify Ms. Barbara Jo White at (301) 415-7130 if you need to change or cancel the above reservations.

Attachments:

- A) Agenda
- B) Status Report
- C) "Risk-Managed Technical Specification (RMTS) Guidelines," Electric Power Research Institute (EPRI), December 2004 (ADAMS Accession No. ML050120351).
- D) Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," August 1998

cc w/attachments: Plant Operations Subcommittee, ACRS
Reliability and PRA Subcommittee, ACRS
M. Snodderly

cc w/o attachments: J. Larkins
J. Flack
S. Duraiswamy
M.Scott

**ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
 JOINT SUBCOMMITTEE MEETING ON RELIABILITY AND PRA AND ON PLANT
 OPERATIONS REGARDING RISK MANAGEMENT TECHNICAL SPECIFICATIONS
 JUNE 15, 2005
 ROCKVILLE, MARYLAND**

- AGENDA -

Designated Federal Official: Michael Snodderly (301) 415-6927

TOPICS	PRESENTERS	TIME
I. Opening Remarks	G. Apostolakis, ACRS	8:30 -8:35 a.m. 5 minutes
II. General Overview of Risk Management Technical Specifications Initiative 4b	R. Tjader, NRR	8:35 -9:05 a.m. 30 minutes
III. Industry Overview of Configuration Risk Management Tools for Initiative 4b	B. Bradley, NEI	9:05 -9:15 a.m. 10 minutes
IV. Attributes of Configuration Risk Management Tools for Initiative 4b	J. Gaertner, EPRI	9:15 -9:45 a.m. 30 minutes
V. STP Implementation of Configuration Risk Management for Initiative 4b	R. Grantom, et al, STP	9:45-10:25 a.m. 40 minutes
BREAK		10:25-10:40 a.m.
VI. SONGs Implementation of Configuration Risk Management	G. Chung, Southern California Edison M. Phillips, Scientech	10:40-11:20 p.m. 40 minutes
VII. Exelon Implementation of Configuration Risk Management – Blended Approach	G. Hughes, J. Steinmetz, Exelon	11:20-12:00 p.m. 40 minutes
VIII General Discussion and Adjourn	G. Apostolakis, ACRS	12:00-12:10 p.m. 10 minutes

NOTE:

- . Presentation time should not exceed 50 percent of the total time allocated for a specific item. The remaining 50 percent of the time is reserved for discussion.
- . 35 copies of the presentation materials to be provided to the Subcommittee.
- . NEI is the Nuclear Energy Institute.
- . STP is the South Texas Project Nuclear Operating Company.
- . SONGs is the San Onofre Nuclear Generating Station
- . EPRI is the Electric Power Research Institute.

**ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
JOINT SUBCOMMITTEE MEETING ON RELIABILITY AND PRA AND ON PLANT
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- STATUS REPORT -

PURPOSE

The purpose of the meeting is to discuss the status of the development of risk management technical specifications related to Initiative 4b titled, "Use of Configuration Management for Determining Technical Specification Completion Times, Related to the Use of Probabilistic Risk Assessment (PRA) and Risk Monitoring Tools," with representatives of the Office of Nuclear Reactor Regulation (NRR), Nuclear Energy Institute (NEI), South Texas Project Nuclear Operating Company (STP), Southern California Edison, Exelon, and Electric Power Research Institute (EPRI). Risk Management Technical Specifications Initiative 4b proposes to rely on PRA and risk monitors to calculate technical specification completion times for returning structures, systems, and components to operable status. The staff has not relied on risk monitors to this extent in other applications, and the staff is seeking feedback from the joint ACRS Subcommittees on Reliability and PRA and on Plant Operations regarding the risk monitor quality and use in Risk Management Technical Specifications Initiative 4b.

The Industry guidance document titled, "Risk-Managed Technical Specification (RMTS) Guidelines," was developed by Electric Power Research Institute (EPRI), December 2004 (ADAMS Accession No. ML050120351) with the help of the Westinghouse Owners Group (WOG) and ABSG Consulting Inc. (ABS Consulting). Industry is using this RMTS Guidelines document to implement Technical Specifications (TSs) changes. Since this RMTS Guidelines is not being endorsed as a NUREG, the joint ACRS Subcommittees on Reliability and PRA and on Plant Operations may decide to review and comment on this RMTS Guidelines and provide a report to the Full Committee as well as provide a letter to the EDO, if deemed appropriate.

BACKGROUND

Since the mid-1980s, the NRC has been reviewing and granting improvements to technical specifications that are based, at least in part, on PRA. The Commission reiterated that it expects licensees to use any plant-specific PRA or risk survey in preparing technical specifications for NRC approval when it issued the revision to 10 CFR 50.36, "Technical Specifications," in July 1995. In August 1995, the NRC adopted a final policy statement on the use of PRA methods in nuclear regulatory activities that encourages greater use of PRA to improve safety decision-making and regulatory efficiency. Since that time, the industry and the NRC have been pursuing increased use of PRA in developing improvements to technical specifications.

Consistent with the Commission's policy statement on technical specifications and the use of PRA, the NRC and the industry continue to develop more fundamental risk-informed improvements to the current system of technical specifications. The staff uses the term "risk management technical specifications" to emphasize the goal of constructing technical specifications that reinforce the pro-active management of the total risk presented by the plant configuration and actions that may be needed to respond to emergent conditions. These

improvements are intended to maintain or improve safety while reducing unnecessary burden and to bring technical specification requirements into congruence with the Commission's other risk-informed regulatory requirements, in particular, the maintenance rule.

The staff has prepared guidance documents to assist licensees in requesting risk-informed completion time (also called allowed outage time) and surveillance test interval extensions (Regulatory Guide 1.177 and Standard Review Plan Chapter 16.1 [NUREG-0800]). Use of this guidance (categorized as "Option 1" in the framework of the Risk-Informed Regulatory Improvement Program) has resulted in risk-informed amendments at numerous plants and in owners groups continuing to submit topical reports to support additional applications for Standard Technical Specification (STS) changes.

The staff is working on eight initiatives for fundamental improvements to the STS with industry:

- **Initiative 1, TS Actions End States Modifications:** This initiative would permit, for some systems, entry into hot shutdown rather than cold shutdown to repair equipment;
- **Initiative 2, Missed Surveillances, Surveillance Requirement (SR) 3.0.3:** This initiative permits the extension of up to one surveillance interval of an inadvertently missed surveillance, after assessing and managing the risk (approved September 2001);
- **Initiative 3, Modification of Mode Restraint Requirements of Limiting Condition for Operation (LCO) 3.0.4 and SR 3.0.4:** This initiative permits, for most systems, transitioning up in mode with inoperable equipment, relying on compliance with the technical specification actions of the higher mode, after assessing and managing the risk (approved April 2003);
- **Initiative 4b, Flexible Completion Times:** This initiative would permit, contingent upon the results of a plant configuration risk assessment, temporary extension of the existing completion time within an LCO using a quantitative implementation of 50.65(a)(4);
- **Initiative 5b, Relocation of all SR Frequency Requirements out of TS:** This initiative would permit SR frequencies to be determined in and relocated to a licensee-controlled TS program;
- **Initiative 6, Modification of LCO 3.0.3 Actions and Completion Times:** This initiative would convert default or explicit entry into the LCO 3.0.3 shutdown track into a completion time for corrective action before beginning shutdown;
- **Initiative 7, Non-TS Support System Impact on TS Operability Determinations:** This initiative would permit a risk-informed delay time before entering LCO actions for inoperability due to loss of support function provided by equipment outside of technical specifications;
- **Initiative 8a and 8b, Remove/Relocate Non-safety and Non-risk Significant Systems from TS that do not meet the four criteria of 10 CFR 50.36:** Initiative 8a would review technical specifications to remove systems that were included solely because they were judged risk significant at one time and have now been shown by analysis not to be. Initiative 8b would make the scope of technical specifications depend only on risk significance.

At the June 15, 2005, joint ACRS Subcommittee meeting on Reliability and PRA and on Plant Operations regarding Risk Management Technical Specifications, the staff will present information only on Initiative 4b. The overall objective of Initiative 4b is to modify the Technical Specifications (TS) to control operation of the plant in a manner more consistent with plant risk in a given configuration. Current TSs address systems independently, and do not generally

account for the combined risk impact of multiple concurrent equipment out of service conditions. The maintenance rule configuration risk assessment requirement in 10 CFR 50.65(a)(4) was added to address this consideration, but does not obviate compliance with current TS requirements. The current TS requirements may present inconsistencies with a configuration risk management approach, and may require plant shutdown, or other actions, that may not be the most risk-effective actions given the specific plant configuration. Central to this discussion are the scope and quality of PRA needed to support the licensing process, and on the coherence of the various regulatory efforts (i.e., the Maintenance Rule, Risk Management Technical Specifications Initiative 4b, and Regulatory Guide 1.200).

The ACRS Subcommittees on Reliability and PRA and on Plant Operations held a meeting on March 25, 2004, with representatives of the Industry and the NRC staff to discuss Risk Management Technical Specifications Initiative 4b. The following is a brief summary of the ACRS Subcommittee Members comments from the March 25, 2004, meeting:

- Dr. Kress asked about NRC assurance that real-time PRAs at the plant meet the quality that they think is needed for this Initiative. The response was that this is the key question of the whole project. It will take a combination of up front reviews of licensee PRAs, commitments and documents, and follow-on oversight by NRC inspectors and headquarters, as appropriate.
- Dr. Apostolakis asked is the staff involved when a reassessment of the completion times take place. And, if no, would they review it afterwards. The response was no, the staff will not be involved in the reassessment, but will be documented so that they can be reviewed afterwards. It was also indicated that there will be a 30 day backstop which must be discussed with the NRC if it is to be exceeded. Further, the licensees' implementation would be reviewed by the NRC staff, maintained as reviewed, and used for implementation.
- Dr. Kress raised a concern that if there are multiple system inoperabilities, the front stop may not be conservative. The response was that once the licensee is in the first completion, there should be corrective maintenance going on and even if there is not, the staff wants to stipulate that within the program risk assessment needs to be done once the second inoperability is entered. This has to be negotiated.
- Dr. Bonaca asked if voluntary entry into the TS is treated the same. The response was that this had to be worked out.
- Dr. Apostolakis asked if there is a definition of a high quality PRA anywhere. The response was that Regulatory Guide 1.200 will be used and it has three elements necessary for a high quality PRA: (1) definition of scope, (2) level of detail, and (3) acceptability. Regulatory Guide 1.200 is currently being developed.
- Dr. Apostolakis asked if the staff plans to review the precalculated configurations in the risk monitor. The response was that some the precalculated configurations would be reviewed, but a final determination has not yet been made.

South Texas Project (STP) is a pilot plant for Risk Management Technical Specifications Initiative 4b and Regulatory Guide 1.200 on PRA quality. STP submitted a license amendment request on August 2, 2004 (ADAMS Accession No. ML042190366). The staff visited the STP site on January 19, 2005 (ADAMS Accession No. ML050330214). The following are highlights from the visit:

- The staff became familiar with the STP configuration risk management process (CRMP) and the CRMP tool, "RASCAL."
- The RASCAL CRMP tool is a database manager for assessing at power risk and for determining an appropriate risk-informed completion time to restore system operability.
- Currently, STP is considering expanding RASCAL to address shutdown conditions. At present, STP uses O-RAM Sentinel to assess shutdown risk.
- Currently, Large Early Release Frequency (LERF) is addressed qualitatively in the STP (a)(4) risk assessments, when necessary. Incorporating LERF assessments into RASCAL is not planned.
- Initiating external event frequencies are averaged into the STP PRA/CRMP program. When external events occur, compensatory actions are taken that are not credited in the PRA/CRMP program.
- STP discussed and provided its procedures on the Configuration Risk Management Program (0PGP03-ZA-0091) and Extended Allowed Outage Time (0POP01-ZO-0006).

DISCUSSION

The effect of Risk Management Technical Specifications Initiative 4b will be to extend the completion time from a nominal value up to a predetermined "backstop" maximum using configuration risk management. A Risk Management Technical Specifications Initiative 4b submittal will include: approved decision-making process, implementation guidance, requirements for PRA technical adequacy, and quantitative configuration and cumulative risk metrics including criteria for shutdown. The concepts for Risk Management Technical Specifications Initiative 4b are completion time front stop, configuration risk management process (CRMP)-based completion time, backstop, risk assessment tools to provide reliable results in a timely manner, and use of a reliable decision-making process.

STP and the San Onofre Nuclear Generating Station (SONGS) are the pilot plants to implement the industry guidance document titled, "Risk-Managed Technical Specification (RMTS) Guidelines," developed by Electric Power Research Institute (EPRI), December 2004 (ADAMS Accession No. ML050120351) with the help of the Westinghouse Owners Group (WOG) and ABSG Consulting Inc. (ABS Consulting).

The RMTS Guidelines is designed to support the implementation of a risk-informed approach to the management of equipment "allowed outage time" (AOT) or maintenance "completion time" (CT) related to safety functions addressed by plant technical specifications. Risk informed front-stop CTs for RMTS will be consistent with the currently-approved TS CTs, but may be revised outside the scope of RMTS via single structures, systems, and components (SSC) outage guidelines of RG 1.177.

The RMTS Guidelines provides a process for operation beyond the front-stop that would be allowable provided the risk of continued operation can be shown to remain within established safety limits. The process for allowing continued operation will involve performance of risk assessments and definition of risk-informed CT (RICT) targets and limits. The RICT is the time from the initiation of a maintenance configuration until a risk threshold or limit is reached. Therefore, the RICT is a calculated value for each maintenance configuration. However, the RMTS RICT will also have an ultimate maximum CT limit (currently established at 30 days), referred to as the "back-stop" CT.

To use the RMTS option for normal planned maintenance, the RMTS Guideline states that two RICTs are calculated before the front-stop CT limit is reached: (1) a risk management action (RMA) RICT; and (2) a safety limit RICT.

The RMTS Guideline directs: (1) at times prior to reaching the RMA RICT, maintenance activity is performed consistent with normal work controls, (2) at times after the RMA RICT but before the safety limit RICT, maintenance activity is performed in association with clearly specified risk management actions, and (3) at or beyond the safety limit RICT, clearly specified actions to reduce the risk, possibly including shutdown, would be required. The RMTS Guideline notes that a safety limit risk threshold is established at an Incremental Core Damage Probability (ICDP) of 10⁻⁵.

The RMTS Guideline describes the assessment process, control and responsibilities. It also provides: (1) general guidance for the assessment, (2) the scope of RMTS and RMTS Assessment, (3) Assessment methods for power operating conditions, (4) managing risk, (5) regulatory treatment of compensatory measures, and (6) documentation. Furthermore, the RMTS Guideline stresses that PRAs and associated configuration risk management (CRM) tools must comply with NRC Regulatory Guide 1.200 requirements applicable to the PRA application type.

The following are important issues for the RMTS Initiative 4b to be successful:

- Reliability: the process needs to be technically correct; achieve realistically conservative results; and the PRA Quality must be sufficient for its application.
- Repeatability: the same plant configuration must consistently achieve the same result; and two plants with similar designs and configurations must achieve similar results.
- Oversight/Enforcement: Initiative 4b must be observable, inspectable, auditable, and documented.
- Exportability: the initiative/process must be applicable to all capable plants.
- Adequacy of PRA and CRMP scope and capability.
- Adequacy of PRA and CRMP updates.
- Adequacy of Quality Assurance practices.
- Need for incorporating the NEI/EPRI Risk Management Guidelines into the Technical Specifications.
- The staff will need to develop a Temporary Instruction for providing inspection guidance.

EXPECTED COMMITTEE ACTION

Since the RMTS Guidelines is not being endorsed as a NUREG, the joint ACRS Subcommittees on Reliability and PRA and on Plant Operations may decide to review and comment on the RMTS Guidelines, if deemed appropriate. The Subcommittee Chairman will provide recommendations and report, if deemed necessary, to the full Committee during the 524th ACRS Meeting summarizing the subcommittees discussions.