COMMENTS ON APRIL 2006 RMTS GUIDANCE DOCUMENT

1. Section 2.1 – The staff has previously agreed that the typical "at-power" PRA models may be applied for RMTS programs in accordance with the revised Table 2-1 (i.e., modes 1-4 with SG cooling in PWRs, modes 1-2 for BWRs). However, section 2.1 retains some of the previous statements which imply some level of additional evaluations/justifications. Specifically:

   - The second sentence of the first paragraph starts with "Thus…", which implies a conclusion is being reached based on the previous content. It is not possible to conclude that PRAs supporting RMTS are at-power models, based on the fact that an RMTS program applies risk insights from the PRA to TS CTs and RMAs.

   - The third sentence of the first paragraph requires a PRA and CRM tool which adequately calculates risk in lower modes, but Table 2-1 simply states that an at-power PRA is adequate for some lower modes.

   - The fourth sentence of the first paragraph identifies some program-specific requirements for applying at-power PRA models to non-power modes.

   - The footnote to Table 2-1 states that RMTS is not applicable in mode 4 for shutdown cooling. This is not accurate, RMTS may be applicable, but the at-power PRA model may not be applied directly.

   - The entire second paragraph (directly following Table 2-1) identifies requirements to justify applicability of an at-power PRA model to RMTS, which is already justified by Table 2-1.

   - The third paragraph (second after Table 2-1) starts with "Thus…", again there is no basis to reach the conclusion of the sentence from the previous content. This entire paragraph does not seem to be in the correct place.

It is recommended that Section 2.1 be rewritten to include the first sentence of paragraph 1, and the last paragraph of the section, up front to define the scope of the RMTS program. After this, there should be a general discussion of needing PRA models which reflect actual plant conditions (i.e., modes). Finally, Table 2-1 should be provided to justify applying at-power PRA models to the specific modes identified, and note that to apply RMTS to other modes will require unique PRA models (i.e., shutdown models). There should also be some justification provided in the writeup (i.e., that the risk at-power is greater than the risk in modes 3 and 4 based on elimination of some transients including ATWS, lower decay heat, etc.).

Modified section. Note that since industry does not believe that it can support a generic demonstration that at-power PRAs are directly applicable to PWR operating modes 3 and 4 (cooling via S/Gs), the provision for the licensee to demonstrate this demonstration is retained. Revised wording is provided below.

2.1 Applicability

A RMTS program is designed to apply the risk insights and results obtained from a plant PRA to identify appropriate Technical Specifications CTs and appropriate compensatory risk management actions associated with plant SSCs that are inoperable. A RMTS program defines the scope of equipment used to define plant configurations to which calculation of a risk informed completion time (RICT) may be applied. These SSCs have front-stop CT requirements, and can be evaluated via the RMTS-supporting PRA and CRM program. Technical Specifications for Safety Limits, Reactivity Control, Power Distribution, and test exceptions are excluded from utilizing RICTs.

PRAs that support RMTS are typically plant specific at-power PRAs. Thus, these PRA's are directly applicable to plant configurations during operation in Modes 1 and 2. For PWRs, RMTS may be extended to apply in operating Modes 3 and 4 (with cooling via steam generators) while for BWRs it may be extended to Mode 3 (with cooling via main condenser). However, licensees who want to apply RMTS for plant configurations in these other operating modes shall either have a PRA and configuration risk calculation tool that adequately calculates a RICT in these modes for the specific plant configurations or perform sufficient analyses to demonstrate that the at-power PRA results provide conservative bounding estimates of risk, and thus can be used to set the RICT. Also, the station configuration risk management (CRM) program (see definition in Appendix A) shall establish the program-specific requirements for application of an at-power PRA to non-power operating modes. Technical Specifications associated with the Cold Shutdown and Refueling modes are not within the scope of this guidance. Table 2.1 provides the applicability of the RMTS program during various operating modes.

Table 2-1

Applicability of At-Power PRA for RMTS to Plant Operational Modes. Note: Mode numbers are in accordance with Improved Technical Specification definitions.

Applicability of At-Power PRA to RMTS	PWR	BWR
Direct Application	1, 2, 3, 4*	1, 2, 3*
Not Applicable	4*, 5, 6	3*, 4, 5

* RMTS is applicable to PWR Mode 4 for cooling via steam generators or BWR Mode 3 for cooling via main condenser; RMTS is NOT applicable to PWR Mode 4 or BWR Mode 3 for cooling via shutdown cooling.

As one example, the NRC staff previously issued a Federal Register Notice (70FR74037, 14 December 2005) that provided a model safety evaluation (SE) and a no significant hazards consideration (NSHC) determination relating to changing BWR Technical Specification required action end state requirements.

2. Section 2.3.1 item 8 has a few cleanup items to address:

   - Bullet items 5 and 6 refer to RICT calculations, but the overall item 8 applies to RICT and RMAT. Agree. Modified items to refer to both RMAT and RICT results.

   - Bullet item 5 for not crediting repair of inoperable SSCs – this needs to be more directly worded: "Repair of inoperable SSCs within the scope of the CRM program cannot be credited in the RICT or RMAT calculations." Agree. Reworded item as suggested.

   - Bullet item 6 for fire risk needs to be expanded to include any significant source of risk. Added bullet after discussion of fire risk as follows:

     - The impact of other external events risks shall be addressed in the RMTS program. This may be accomplished via one of the following methods:

     (A) Provide a reasonable technical argument (to be documented prior to implementation of the RMTS program) that the external events that are not modeled in the PRA are not significant contributors to configuration risk.

     (B) Perform an analysis of the external event contribution to configuration risk (to be documented prior to implementation of the RMTS program) and incorporate these results in the RMTS program. This may be accomplished via performing a reasonable bounding analysis and applying it along with the internal events risk contribution in calculating the configuration risk and the associated RICT.

     (C) Provide direct modeling of the external events in the PRA / CRMP plant model.

   - Bullet item 7 is redundant to section 2.1 – as written, it would not allow a licensee with realistic transition and shutdown risk models to apply them to the RMTS calculations, since this item requires a bounding or conservative analysis. Agree. Deleted.item.

3. Section 2.3.1 items 10 and 11 seem redundant and not consistent with what has been agreed to previously. Specifically, item 10 prohibits a RICT when a loss of function occurs, but this is not consistent with prior discussions where

all trains may be inoperable due to inability to mitigate a seismic event (which is a required function of SI and CCW) for which industry has proposed using an RICT. The modified STP TS have actions for "two or more" trains inoperable, so it is not clear what the words in item 11 "Unless otherwise permitted by the TS" exactly mean. It is the staff's position that voluntarily disabling all safety trains under a RICT is not appropriate, and that the use of an RICT when all trains are inoperable should be restricted to emergent conditions. Recommend something like:

10. Configurations involving inoperability of all trains of a system shall not be voluntarily entered using a RICT. Emergent conditions which result in inoperability of all trains may apply a RICT if the condition does not involve a total loss of function of all trains.

Based on discussion with NRC staff at NEI (26 April 2006), agreement reached to keep the current wording except expanded item #11 to include no RMTS entries in which total loss of function occurs (deleted word planned).

4. Section 2.3.1 item 14 – it is not necessary to require the cumulative risk impact be determined as part of the PRA update process, this is simply a convenient time to do this task. Agree. Modified last sentence as follows: "This assessment of cumulative risk impact may be conducted as part of the station periodic PRA updates; however, it shall be conducted on a periodicity not to exceed two refueling cycles."

5. Section 2.3.1 item 15 – the staff believes that considering RMAs to address CCF when an emergent failure has occurred represents a requirement of the program (i.e., not a "should"). Agree. Changed to shall.

6. Section 2.3.4 item 5, as well as 2.3.5 item 4 – these items' intent is not understood. RG 1.200 would require assessing dependencies, why is a separate call out necessary for this application? Removed Section 2.3.4 Item #5 since it applies to the CRM (not the PRA). Modified Section 2.3.5 Item # 4 as follows:

   Any modeled recovery actions credited in the calculation of a RICT shall be applicable to the plant configuration.

7. Section 2.3.4 item 8.3 – this should not be restricted to "modeling" errors, but includes any error in the PRA which may adversely impact the calculation of the RICT. Agree. Deleted word "modeling".)

8. Section 2.3.4 item 10 – this should not be necessary based on section 2.1. In accordance with discussion in Item #1 above, retained this provision. However, modified wording for clarity as follows.

   For plants with an at-power PRA that does not directly address lower operating modes, as discussed in Section 2.1, and the plant desires to use the PRA results to calculate RICTs for plant configurations that originate in lower plant operating modes, a technically-based argument for application of the Mode 1 and 2 model to other plant operating modes shall be provided (e.g., provide assurance that risk associated with other modes addressed in the RMTS is bounded by the Modes 1 and 2 PRA model).

   (Note – due to comment in #6 above, this item is renumbered in the Guidance Document as Section 2.3.4 Item #9.)

9. Section 3.2.2 item 5 third bullet – this item states that evaluation of risk for a configuration which has been exited is unnecessary except to evaluate long-term cumulative risk and refers to section 3.3.3, which is the assessment of the program against RG 1.174 limits. This is not accurate – if a RICT is in effect, then the risk accumulated must be determined in order to calculate the RICT/RMAT. Agree. This item has been removed.

10. Section 3.2.2 page 3-9 – a RICT cannot be "not met"; the LCO is not met when the RICT is exceeded. Agree. Modified last sentence as follows: In the event a Technical Specification LCO is not met, the applicable actions specified by the Technical Specification Action Statement shall be taken. (Note – this is last sentence in Bullet Item #6 now located at bottom of p. 3-8.)

11. Section 3.2.3 page 3-11 first paragraph after the last bullet item – if the planned duration of maintenance exceeds the RMAT, RMAs must be considered and implemented throughout the maintenance activity. The activity does not suddenly become risky at the point in time the RMAT is exceeded. This sentence implies that is the case, and that there is flexibility in holding off on RMAs. Agree. Modified as follows:

    For preplanned maintenance activities for which the RMAT is anticipated to be exceeded, RMAs shall be implemented at the earliest appropriate time.

    Also added these words as a requirement in Section 2.3.1 Item #3. (Thus, this now is an explicit requirement in Section 2.)

12. Section 3.2.3 page 3-11 second paragraph after the last bullet item – the phrase "are modeled in the PRA" is not understood (applicable specifications are not modeled in the PRA). Agree. Modified sentence as follows: "In the

context of this requirement, an “applicable” specification is one in which the applicable actions contain the provision to utilize a RICT and the plant configuration is modeled in the PRA.”

13. Section 3.3.5 next to last sentence is not understood regarding the use of the word “checklists” and “overlap”. The staff’s position is that all significant sources of risk which may impact a RICT must be quantified. Any exceptions must be reviewed an approved by the staff as part of the RMTS approval. The licensee is not free to determine on his own components for which external events are insignificant – this must be done a priori with staff approval, or staff approval of a methodology to assess such configurations. It is our intent that it will be very difficult for a licensee who does not have a full scope PRA to implement RMTS. Modified section to delete the referenced sentence (this sentence was intended to address RMAs and thus was out of place). Added separate paragraph to discuss evaluation of external events for development of applicable RMAs. This paragraph is provided below.

    In addition to the evaluation of external events for potential RICT impact, these events should be evaluated for insights which permit development and implementation of applicable risk management actions. The results of these evaluations may be incorporated into plant programmatic controls (e.g. procedures, checklists, etc.).

14. Section 3.4 second paragraph last two sentences – once again, these imply that RMAs apply only when the RMAT threshold is reached, which should not be the case. The last sentence is misleading since the ICDP/ILERP are integrated accumulated risk, and changing the plant configuration cannot eliminate risk which has already been incurred. Modified wording to be consistent with changes described in NRC Comment # 11 above.

15. Section 3.4.1 first paragraph last sentence – it the RICT is reached, there is no allowance to transfer to a lower risk configuration – the TS action must be applied. What is the intent of this? Agree. Modified sentence as follows: If the target outage time reaches the RICT, action must be taken to implement the applicable Technical Specification action statement(s).

16. Section 4.1 second paragraph conflicts with section 2.1 in that the at power PRA model is acceptable in modes 3 and 4 (PWR) and modes 1 and 2 (BWR) without any further justifications. Agree. Modified paragraph as follows:

    For application to RMTS the scope of the PRA directly addresses plant configurations during Modes 1 and 2 of reactor operation. Where the PRA is to be used to extend CTs that originate in the lower modes described in Section 2.1, the PRA model must

directly address lower operating mode configurations, or a technically-based argument for application of the Mode 1 and 2 model to these other operating modes must be provided (e.g., it must provide assurance that risk associated with other modes addressed in the RMTS is bounded by the Modes 1 and 2 PRA event sequences).

17. Section 4.1 says the scope "should" address modes 1 and 2? See changes made described in Item #16.

18. Section 4.1 first paragraph the last sentence seems out of context of this paragraph. Made this sentence a separate paragraph.

19. Section 4.1 second paragraph first sentence – it is not understood what this is intending to require of the licensee. For application to RMTS, the scope of the PRA directly addresses plant configurations during Modes 1 and 2 of reactor operation. Modified for clarity as follows:

    For application to RMTS the scope of the PRA directly addresses plant configurations during Modes 1 and 2 of reactor operation. Where the PRA is to be used to extend CTs that originate in the lower modes described in Section 2.1, the PRA model must directly address lower operating mode configurations, or a technically-based argument for application of the Mode 1 and 2 model to these other operating modes must be provided (e.g., it must provide assurance that risk associated with other modes addressed in the RMTS is bounded by the Modes 1 and 2 PRA event sequences).

20. Section 4.2 – the entire numbered list is redundant to section 2.3.4. Deleted duplication.

Additional changes based on ACRS comments (from 4/28/2006 meeting).

1. Modified last paragraph on page 1-3.

The RMTS process is intended to provide a comprehensive risk informed mechanism for expeditious identification of risk significant plant configurations. This will include implementation of appropriate compensatory risk management actions, while retaining the current Technical Specifications action statement requirements, including the action to shut down the plant when prudent. In practice, this program is consistent with 10CFR50.65(a)(4) maintenance planning conditions. That is, the program retains the current 10CFR50.65(a)(4) thresholds for identifying normal and high risk plant configurations. The processes described herein provide additional requirements from those required by the Maintenance Rule (a)(4). In addition, the revised process ensures timely risk assessments of emergent (unscheduled) plant configurations to ensure that high-risk conditions associated with multiple component outages are identified early.

This document also includes guidance on the scope and quality of the risk-informed tools used in performing the configuration risk assessments.

2. Modified Tables 2-2 and 3-1 to clarify actions associated with thresholds.

Table 2-2
RMTS Quantitative Risk Management Thresholds

Criterion*		RMTS Risk Management Guidance
CDF	LERF	
$\geq 10^{-3}$ events/year	$\geq 10^{-4}$ events/year	- Follow the Technical Specification requirements for required action not met.
ICDP	ILERP	
$\geq 10^{-5}$	$\geq 10^{-6}$	- Follow the Technical Specification requirements for required action not met.
$\geq 10^{-6}$	$\geq 10^{-7}$	– RMAT and RICT requirements apply – Assess non-quantifiable factors – Implement compensatory risk management actions
$<10^{-6}$	$<10^{-7}$	– Normal work controls

* In application of these RMTS criteria, the criteria for both columns apply simultaneously and actions are taken based on the more restrictive one.

Table 3-1
RMTS Quantitative Risk Management Thresholds

Criterion*		Maintenance Rule Risk Management Guidance	RMTS Risk Management Guidance
CDF	LERF		
$\geq 10^{-3}$ events/year	$\geq 10^{-4}$ events/year	- Careful consideration before entering the configuration (none for LERF)	- Follow the Technical Specification requirements for required action not met.
ICDP	ILERP		

$\geq 10^{-5}$	$\geq 10^{-6}$	– Configuration should not normally be entered voluntarily	- Follow the Technical Specification requirements for required action not met.
$\geq 10^{-6}$	$\geq 10^{-7}$	– Assess non-quantifiable factors – Establish compensatory risk management actions	– RMAT and RICT requirements apply – Assess non-quantifiable factors – Implement compensatory risk management actions
$<10^{-6}$	$<10^{-7}$	– Normal work controls	– Normal work controls

* In application of these RMTS criteria, the criteria for both columns apply simultaneously and actions are taken based on the more restrictive one.

(3) Added to Section 2.3.2 documentation or RMA.

6.5 Risk management actions implemented.

(4) Modified wording Section 2.3.4 Item #5 to reflect discussions between NEI and NRC staff. (Note – this item renumbered, see NRC Comment #6 in previous section.

If the PRA model is constructed using data points or basic events that change as a result of time of year or time of cycle (examples include moderator temperature coefficient, summer versus winter alignments for HVAC, seasonal alignments for service water), then the RICT calculation shall either; 1) use the more conservative assumption at all time; or 2) be adjusted appropriately to reflect the current (e.g., seasonal or time of cycle) configuration for the feature as modeled in the PRA. Otherwise, time-averaged data may be used in establishing the RICT.

(5) Incorporated various other editorial changes.

Note – did NOT make any changes to address other discussion items, i.e. (A) instantaneous CDF (accepted term with no suggested improvement), (B) LERF capability (wording form ASME PRA Standard) and (C) legal wording in Tables 2-2 and 3-1 (accepted Technical Specification terms from industry Tech Spec reviewers.