RIC 2010
Plant Experience for Implementation of Risk-Informed Technical Specification Initiative 4b on Risk Managed Technical Specifications

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RMTS Outline

- Background
- RICTCal – Risk Informed Completion Time Calculator (Operation's RMTS tool)
- RMTS Use at STP
- RMTS Lessons-Learned at STP

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RMTS at STP

- Approved by NRC on 7/13/07
- Added RMTS Tech Spec 6.8.3.k:

k. Configuration Risk Management Program (CRMP)

A program to calculate risk-informed completion time in accordance with NEI 06-09, "Risk-Managed Technical Specifications (RMTS) Guidelines, Rev. 0". The CRMP may be used for calculating a risk-informed completion time only in Mode 1 and Mode 2. In accordance with NEI 06-09, the completion time determined using the CRMP shall not be more than 30 days.

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Example RMTS LCO Action

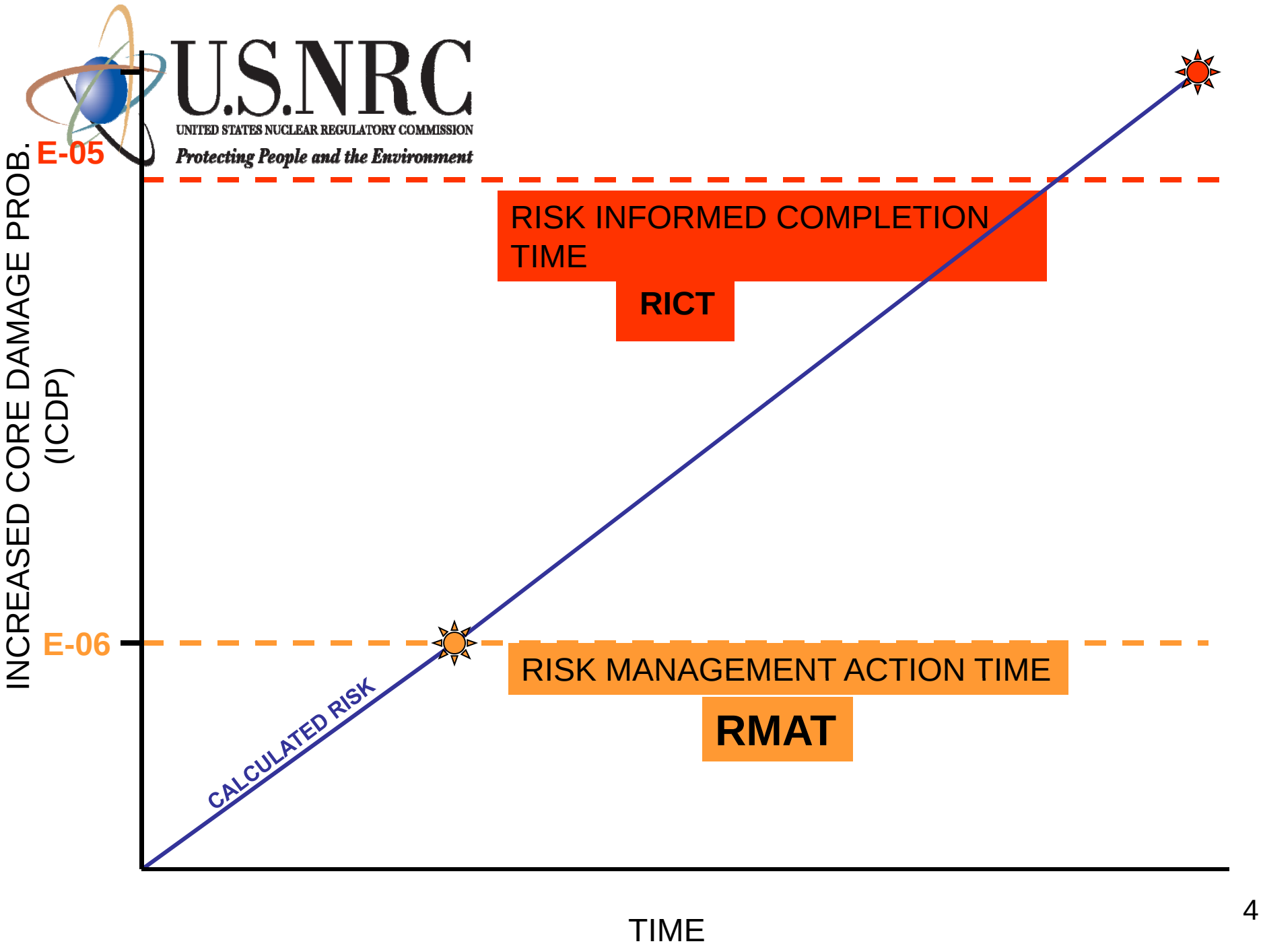
3.7.14 At least three independent Essential Chilled Water System loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With only two Essential Chilled Water System loops OPERABLE, within 7 days restore at least three loops to OPERABLE status or apply the requirements of the CRMP, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With two or more Essential Chilled Water System loops inoperable, within 1 hour restore at least two loops to OPERABLE status or apply the requirements of the CRMP, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.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INCREASED CORE DAMAGE PROB. (ICDP)
E-05
E-06
RISK INFORMED COMPLETION TIME
RICT
RISK MANAGEMENT ACTION TIME
RMAT
CALCULATED RISK
TIME

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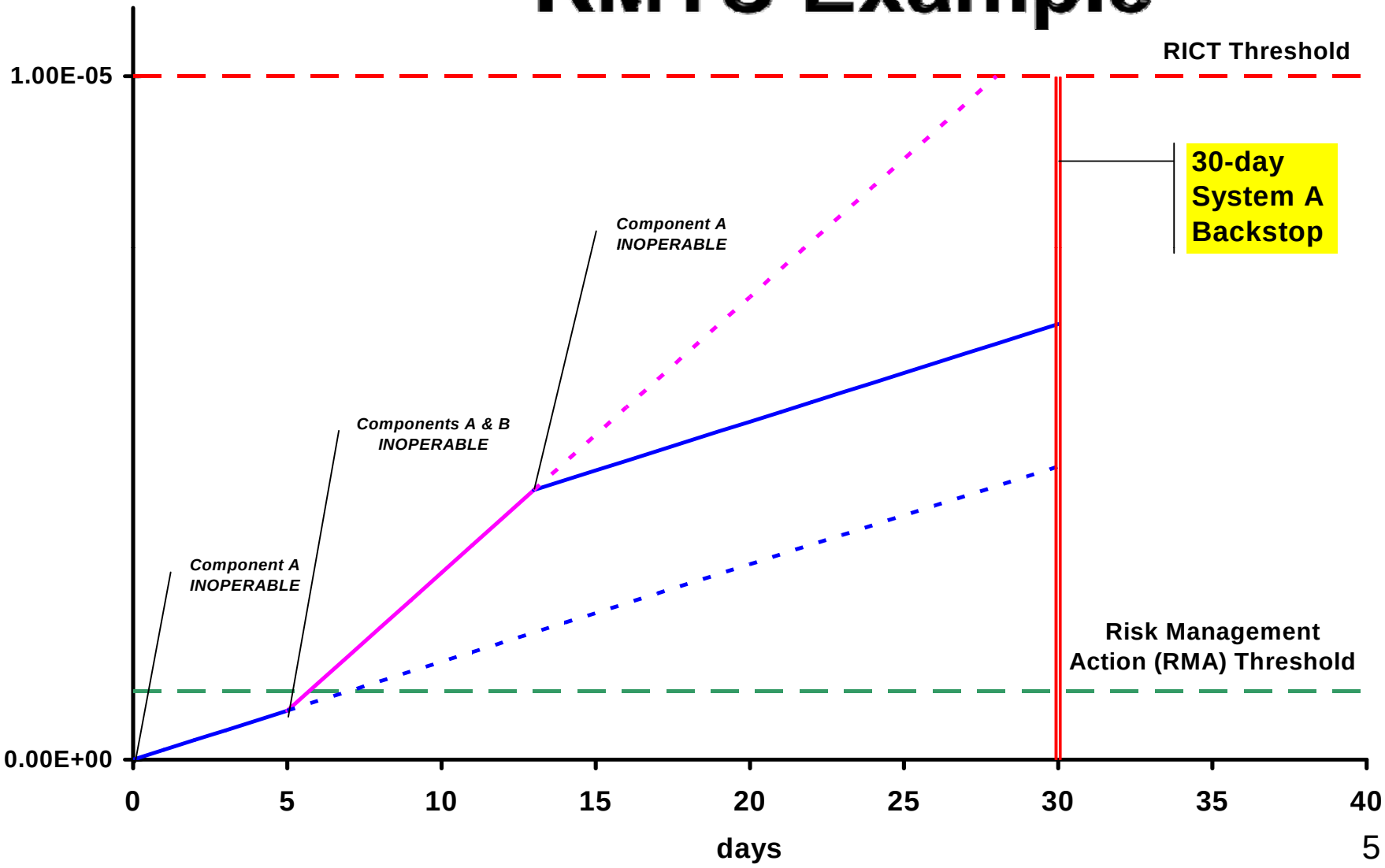
RMTS Example



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What is RICTCal?

- RICTCal = **Risk Informed Completion Time Cal**culator
- Extension of the On-Line Maintenance (a)(4) tool, RAsCal, Measures increases in ICDP and ILERP based on OPERABLE/INOPERABLE times
- Calculates time remaining (RMAT & RICT) to specified risk thresholds in accordance with RMTS
- Located on STP's enterprise database platform (ORACLE)

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STP RMTS Experience

- Used for planned 1E 120VAC instrument inverter maintenance, 24 hour TS front stop. NRC performed inspection activity and QA performed RMTS audit.
- Used to replace Train A and Train C class 1E batteries in Units 1 & 2 - 5 day work window planned. 2 hour TS front stop. No risk threshold issues
- Not typically used but on occasion it has almost been used (e.g., instrument inverter failure and emergent ECW pump maintenance. (Didn't have to mobilize for the NOED we "might" need)

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Lessons Learned (from a software development perspective)

- Early involvement from Operations and Work Control
- Draft procedures and other plant specific guidance documents with multiple review cycles BEFORE beginning software development
  - Electrical trains pose particular issues relative to cascading LCO impacts (STP wrote a special procedure to ensure consistency)
- Train on RMTS concepts in multiple Licensed Operator Requal cycles
  - “multiple clocks” [e.g., front stop, RMAT, RICT (ICDP or ILERP), back stop]
  - scenario development
  - software demos

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STP RMTS Lessons

- Important to train on new concepts like "PRA Functional", RMAT, and RICT. Target training to Operations, Work Control, Station Management, and Engineering.
- Formed RMTS working group and met monthly to develop program, procedures, and policies.
- RMTS has improved the quality of the station’s working environment by providing an approved process for addressing Tech Spec equipment issues while also reducing administrative and regulatory burden for both STP and NRC

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STP RMTS Lessons

- Dose mitigation functions of Control Room HVAC need to be addressed as separate action statements for CRMP purposes. Take away is that implementation of RMTS is broad-scope change; look for cascading system-to-system impacts
- Dose is not modeled in PRA. CDF/LERF are key surrogate figures-of-merit.
  - Restricts (can't go past front stop) RMTS use for systems supporting dose function relative to cooling/humidity specification for Filtration, Essential Cooling Water, Essential Chillers for more than one train out of service.

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Example Use of RMTS

- Extended LCO Train Weeks supporting major DG inspections and other train related work
- Replacing Class 1E Batteries on-line
  - 2 hour Tech Spec front stop
  - Rigorous pre-job challenge reviews
  - Used RMTS procedures to control the whole evolution

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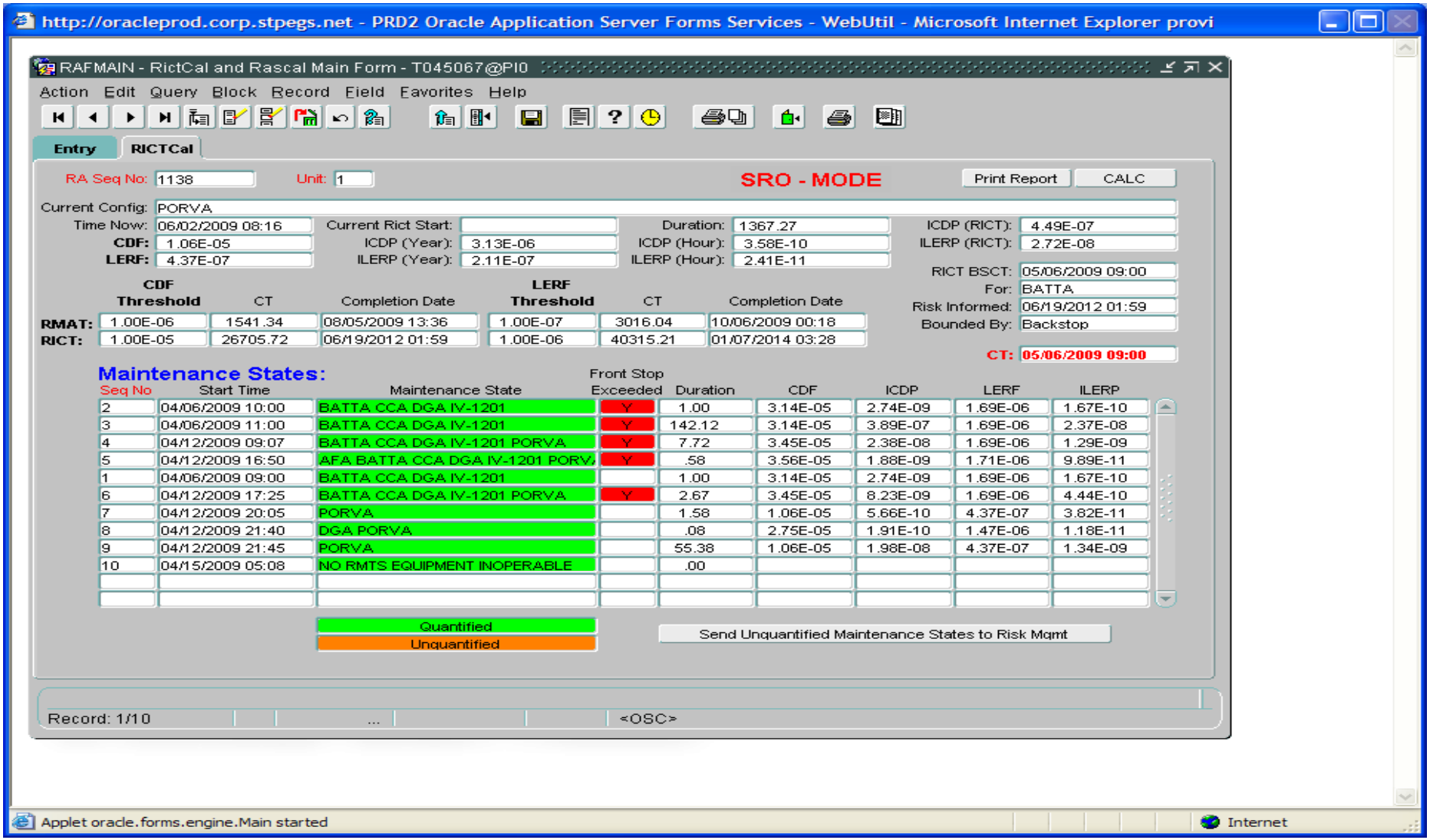

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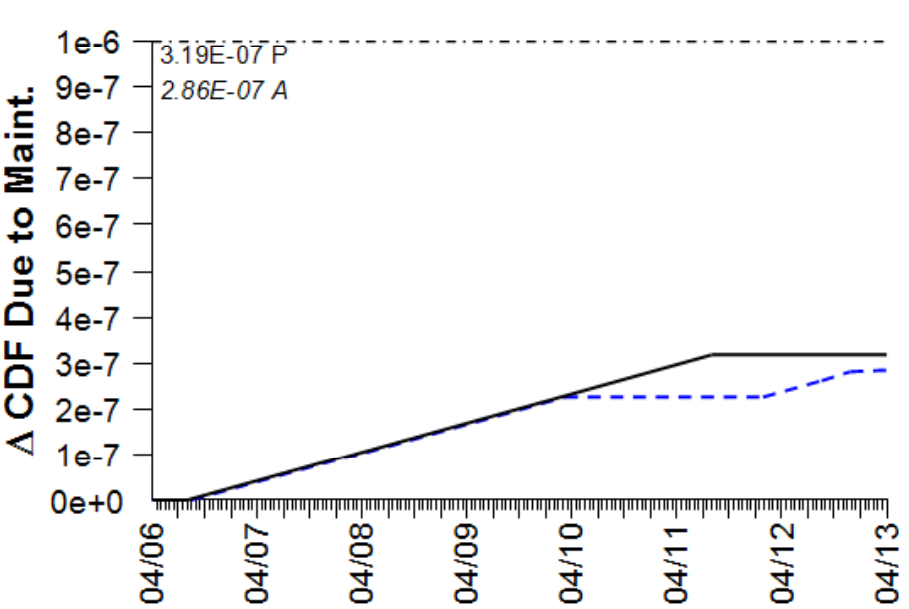
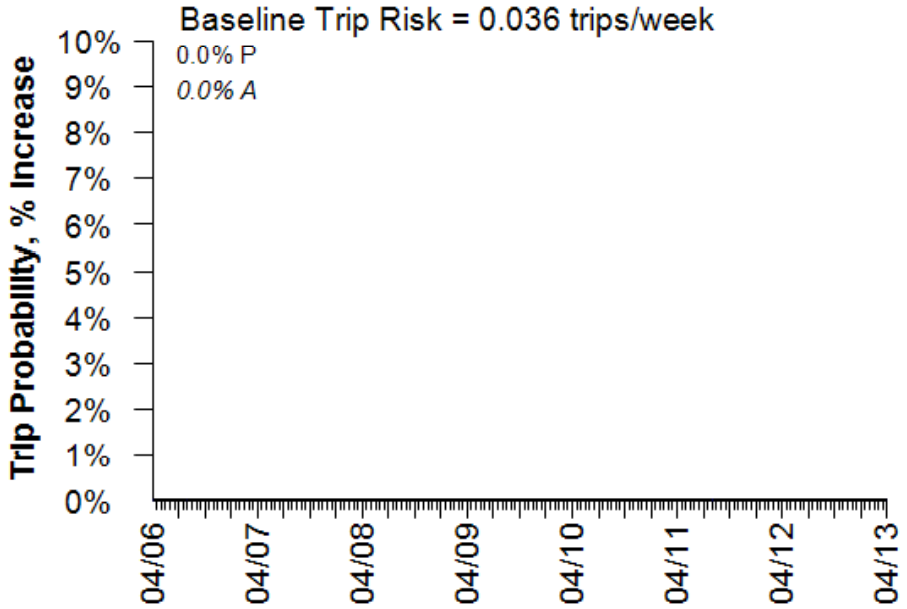
Actual Risk Profiles for Unit 1 Week of 04/06/2009





PRA Component	Planned Time Non-Functional	Planned Time Functional	Duration (hh:mm)		Actual Time Non-Functional	Actual Time Functional	Duration (hh:mm)
BATTA	N/A	N/A	N/A		04/11/2009 19:42	04/12/2009 15:41	019:59
BATTA	04/06/2009 08:00	04/11/2009 08:00	120:00		04/06/2009 09:00	04/09/2009 22:25	085:25
PORVA	N/A	N/A	N/A		04/12/2009 09:07	04/12/2009 23:59	014:52

BOP Component	Planned Time Non-Functional	Planned Time Functional	Duration (hh:mm)		Actual Time Non-Functional	Actual Time Functional	Duration (hh:mm)
NONE			N/A				

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STP RMTS Experience

Date	Tech Spec & Component	TS Front Stop	RMAT	RICT	Actual Inop Time	Actual ICDP	Actual ILERP
3/17/08	TS 3.8.3.1 Class 1E Instrument Inverter #1203 Unit 1	24 Hr	> 30 days	30 day Backstop	29.1 Hr	9.7E-09	7.2E-10
3/23/09	TS 3.8.3.1 Train C 1E Battery Unit 1	2 Hr	2 weeks	30 day Backstop	3.6 days	2.7E-07	1.8E-08
3/30/09	TS 3.8.3.1 Train C 1E Battery Unit 2	2 Hr	2 weeks	30 day Backstop	3.6 days	2.7E-07	1.8E-08
4/6/09	TS 3.8.3.1 Train A 1E Battery Unit 1	2 Hr	2 weeks	30 day Backstop	6.6 days	4.4E-07	2.7E-08
4/13/09	TS 3.8.3.1 Train A 1E Battery Unit 2	2 Hr	2 weeks	30 day Backstop	3.5 days	2.3E-07	1.4E-08

2 train stations would realized increased operational flexibility, most likely 2/3 that of a 3 train station.

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Future Planned RMTS Uses

- Planning to replace ESF Transformer on-line
- Evaluating other uses for RMTS to incorporate safety and reliability improvements

NEA
NUCLEAR ENERGY ASSEMBLY

B. Ralph Sylvia Best of the Best Award Presented to STP Nuclear Operating Company South Texas Project for its Risk-Managed Technical Specifications

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Summary

- RMTS is a significant process and technological improvement for nuclear power plant operation & maintenance
- It is also a quality of life/work enhancement
- It facilitates safety and reliability improvements by managing plant configurations
- All US risk groups should have RMTS in their respective strategic plans