

Status of Risk Evaluation Guidance Updates Developed by the Group for Risk Evaluation and Assessment Tools Review (GREATR)

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Meeting Details and Purpose

- Observation Public Meeting
- Provides public attendees the opportunity to observe the NRC discussing regulatory issues
- Purpose: provide an update of ongoing work by the GREATR staff
- Meeting focus: Three specific technical areas which will be discussed shortly.

Meeting Agenda

- Introductions/Opening Remarks
- Opening Remarks by NEI
- GREATR Overview & Refresher
- Presentation of Three Topics with Draft Resolutions
 - Enhanced Realism for Offsite/Onsite Power Recovery Probabilities
 - Improved Clarity & Consistency on Initiating Event Assessments
 - Update to the Risk Assessment of Operational Events Handbook, Volume 1, “Internal Events”
- Public Comments/Questions
- Adjourn – Meeting Concluded

Introductions

- 1) NRC
- 2) Industry/NEI
- 3) Members of Public

Opening Remarks

- 1) NRC
- 2) Industry/NEI

GREATR Overview & Refresher

- Team Members of GREATR are:
 - John David Hanna (Lead), NRR/DRA
 - Alex Garmoe (Backup-Lead), NRR/DRO
 - Christopher Hunter, RES/DRA
 - Latonia Enos-Sylla, RES/DRA
 - David Werkheiser, Region I
 - Andy Rosebrook, Region II
 - Dariusz Szwarc, Region III
 - Rick Deese, Region IV

*The takeaways for this slide are that
1) the group is comprised of working
level analysts and SRAs, 2) we have
representation across all four regions,
and both NRR and RES.*

When Did GREATR Start and What Are We Trying to Achieve?

- The Charter was signed out in July 2023.
- Standing Committee
- Purposes:
 - To coordinate and conduct activities for RASP Handbook reviews, including **developing new and enhanced RASP Handbook guidance** as necessary for emerging complex issues specifically identified in ROP/SDP implementation, or feedback by SRAs, as the need and priority demands.
 - To **provide input for defining User Need Requests (UNR)** and subsequent feedback on proposed UNR task requirements, i.e., clarification of task scope and resource burden, as necessary, with appropriate recommendations to ensure timely coordination of projected UNR activities,
 - To **review SPAR model issues and assumptions to determine if a consensus approach can be developed** that would result in recommendations for global SPAR model modifications, and
 - To **keep management in NRR/DRA, NRR/Division of Reactor Oversight (DRO), and RES/DRA informed** on the status of all Risk Informed Project Team activities.

Who Are Stakeholders and Key Stakeholders?

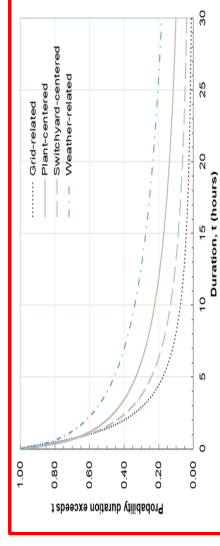
- RES/DRA – Branch Chiefs for Performance & Reliability, and Probabilistic Risk Assessment
- NRR/DRA – Branch Chief for PRA Oversight
- NRR/DRO – Branch Chief for Reactor Assessment
- RES/DRA – Branch Chief for Human Factors & Reliability – (if Human Reliability issues are potentially impacted)
- Idaho National Laboratory
- Regional Senior Reactor Analysts
- NRR/DRA Division Director and Deputy Division Director
- RES/DRA Division Director and Deputy Division Director
- Nuclear Energy Institute
- **PWR/BWR Owners Group**
- Senior Technical Advisors for PRA in RES and DANU
- Senior Risk and Reliability Analysts on ANS/ASME Standards Committee (when PRA standards are potentially impacted)

Recently Completed Tasks

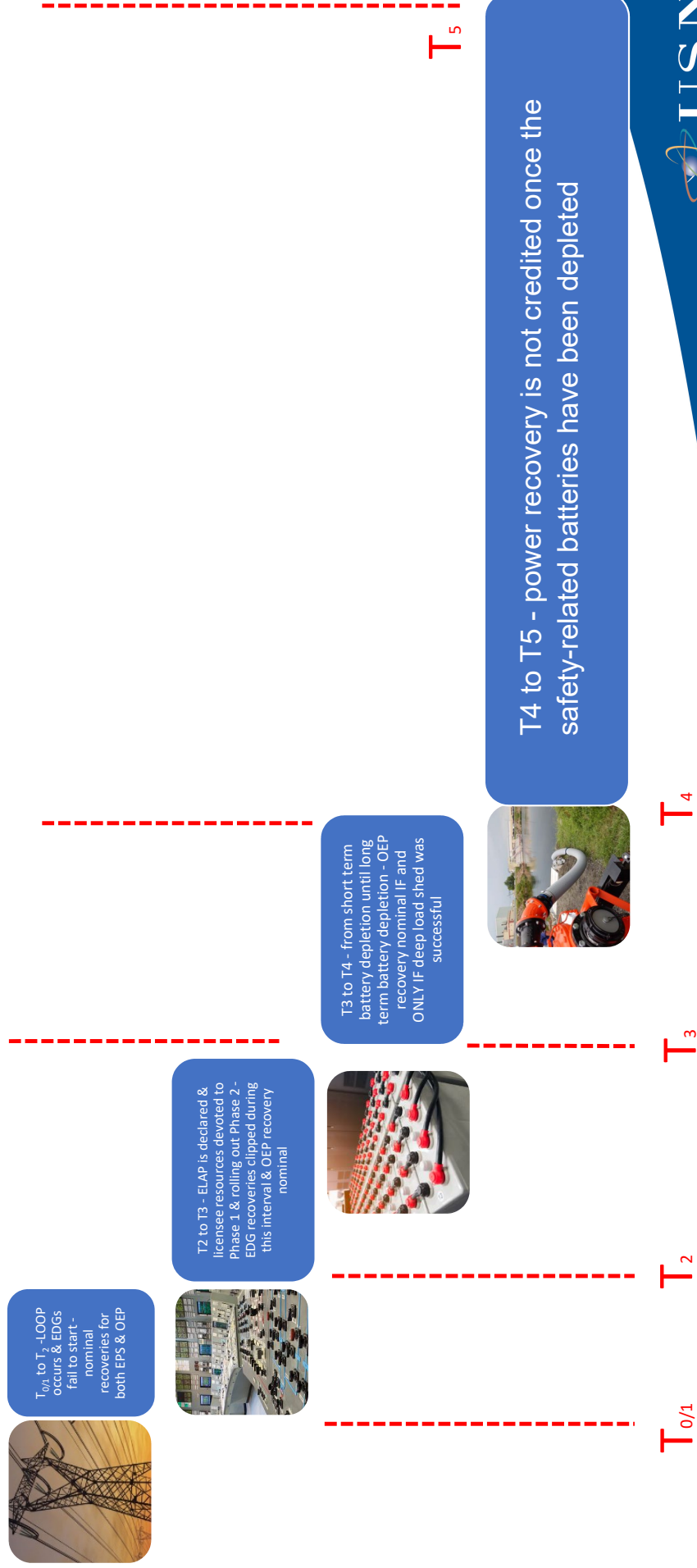
- Three adjustments to SPAR Models recently made:
 - PWROG revised data for FLEX Phase 2 equipment
 - FLEX Phase 1 of course is currently in all the SPAR models
 - FLEX Phase 3 is not and will not be credited
 - Turning off N+1 FLEX equipment nominally
 - Timing issues in 'N' equipment fails, but analyst discretion applies
 - Adjust mission time for SBO/ELAP sequences to 24 hours from 72 hours
 - Event tree modeling to 72 hours will remain in SPAR models (i.e., those trees will not be “pruned” but will be turned “off” nominally

EPS/OEP Recoveries - Adjustments

- In the NRC SPAR models, OEP/EPS modeling would be adjusted in the following manner:
 - Treat early and late EDG failures differently
 - EDGs Fail to Start, so early SBO/ELAP
 - EDGs Fail to Run, so late SBO/ELAP
 - Removing offsite power or on-site power recoveries in certain time windows based on our state-of-knowledge
- Additional guidance in RASP, Volume 1 regarding shifting of the OEP recovery curves for EDG Run Failures
 - Guidance on the “hard way”
 - Guidance on the “easy way”



Station Blackout - prompt scenario



EPS/OEP Recoveries

- **Description of the time “break points:”**
 - T_0 = time of the LOOP occurrence
 - T_1 = the time the EDGs or other onsite power fails
 - T_2 = ELAP declaration time (note this can be very plant specific but generally is in the 1-hour time frame)
 - T_3 = nominal (plant-specific) safety-related battery depletion time
 - T_4 = extend (plant-specific) safety-related battery depletion time (i.e., deep load shed is successful)
 - T_5 = mission time of the PRA model or 24 hours

	Basic Event Nomenclature	Fault Tree Nomenclature	Typical Basic Event “structure”
Offsite Power	OEP	OPR	OEP-XHE-XL-NR__H
Onsite Power	EPS	DGR	EPS-XHE-XL-NR__H

Initiating Event Assessments

Proposed Solution:

	SDP	MD8.3	ASP	NOED
If an “Event” Assessment only	Set IE = 1.0	Set IE = 1.0	Set IE = 1.0	Not applicable
If an “Event” caused by a condition, then:	Consider evaluating it both ways & chose the most representative.	Set IE = 1.0	Consider evaluating it both ways & chose the most representative.	Not applicable
Subtract out the base case?	Yes, consistent with other RASP guidance.	No, the focus is on proximity to CCDP = 1.0.	No, base is not normally subtracted.	Not applicable.

The language added to the RASP manual will be:

- Flexible and inclusive, and allow the analyst some discretion in the approach, particularly if a condition caused the IE.
- Verbiage will be added regarding recovery (not repair) of lost functions, e.g., LOCHS or LOMFW) where the risk-impact could be rapidly minimized, (say opening of MSIVs). The guidance will refer to Section 6.0 of RASP manual.

Initiating Event Assessments – Cont.

- **Proposed Guidance Changes:**

- The IMC-0308, Attachment 3, states: “In situations where the nominal IE frequency is greater than 1.0, the CCDP estimate is calculated by adding 1.0 event per year to the nominal frequency.”
 - Mostly a “non-issue” for At-Power PRA Models; modeling of Shutdown issues may be affected.
- An ROP feedback form has been submitted regarding the need for a Planning SERP on any event that is being assessed under SDP. The intent is to remove that requirement, since the IFRB now accomplishes most (if not all) of the purposes here.
- For those scenarios where conditions caused an IE, and both modeling techniques are performed, it is possible that there would be two (different) calculated values.
 - There would be discretion for the analyst to use either if the conditional/event analysis more closely matches the as-built/as-operated plant, or if the conservatisms were less in one vs. the other assessment.
 - Group decided to eliminate the “higher of 2 values” language.

RASP Volume 1 Update

- **What sections of RASP Handbook are being adjusted and in what manner:**
 - Sections 1-4 – largely complete; editorial changes mostly.
 - Section 5 – Common Cause Failure (CCF) Modeling –
 - also largely complete
 - add in guidance on Component Specific CCF modeling
 - Causal Alpha Factor method recommendations for non-conforming case; treated as a possible sensitivity analysis
 - Guidance on cross-unit CCF will be adjusted
 - SPAR models are due for a data update in 2025
 - Sections 6-7 - largely complete; editorial changes mostly.
 - Section 8 – Initiating Events analysis – GREATR sub-group has developed recommendations and just working on the fine points

RASP Volume 1 Update – Cont.

- **What sections of RASP Handbook are being adjusted and in what manner:**
 - Section 9 – Human Reliability analysis
 - Joint Human Error Probability floor – adjust the language to be consistent with new ASME/ANS standard, i.e., eliminate “hard floor”
 - SDP is the only processes directly mentioned in RASP
 - Recognize a strong consensus about maintaining it & potential conflict with other portions of NRC on the “floor” values, however...
 - Analysts will still have discretion to use their judgement, i.e., more latitude
 - Additional language probably needed for evaluating cutset w/ multiple HEPs
 - Additional verbiage regarding IDHEAS-ECA, recommending usage
 - Section 10 – Loss of Offsite Power Initiating Events – GREATR subgroup has recommendations
 - Section 11 – Support System Initiating Events minor changes

Key Messages

- The GREATR group is a standing working group with diverse, practical PRA experience, tasked with improving our guidance & models.
- The proposed changes will, in the NRC's estimation, improve realism in the SPAR models and enhance consistency.
- Guidance and proposed model changes are DRAFT.
- Next steps, following this public meeting, will be to brief NRC managers on the proposed changes. If approved, then move forward with issuing RASP Volume 1, Revision 3.

Discussion and Q&A



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**Public Questions
and Comments**

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Closing Remarks

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Meeting Concluded

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**Short Break
Resume at 2:00pm Eastern**