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Subject: 09-05-13 IA Concerns, rev 0.pptx
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Attachments: [09-05-13 IA Concerns, rev 0.pptx](#)

Chris, Ed;

The presentation we have prepared for our meeting on 9/5 is attached.



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Integrated Assessment Concerns

Sept 5, 2013



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STORIED HISTORY
BRIGHT FUTURE

Content

- BDB Evaluations
- Crediting FLEX
- HRA
- IA Trigger and Scope
- APM Determinations

BDB Evaluations

- The HRR and IA are Beyond Design Basis evaluations
- BDB events should be evaluated with reasonable confidence in a flexible operational capability for response
- Our suggested approaches to an IA provide a reasonable approach to evaluating flooding effects on a site.
 - Phase 2 evaluation “determines whether additional regulatory actions are necessary to protect against the updated hazards”
- The IA ISG seems to require a more rigorous approach

Crediting FLEX

- FLEX is required to cope with BDB events, including consideration of flooding
 - Implementation was guided by a NRC endorsed procedure NEI 12-06
 - Design will be approved by NRC
- Concern
 - In order to credit FLEX for responding to a BDB flood, the IA ISG applies an additional reliability standard

Crediting FLEX

- Approved FLEX support guidance (NEI 12-06) is sufficient to show feasibility and reliability for BDB events
 - Procedures
 - Clear criteria for entry into FSG
 - Evaluation of integration with existing procedures
 - Simplified to the extent possible
 - Duration: safe and stable state
 - Reviewed, simulated and validated to the extent necessary to ensure feasibility
 - Controlled
 - Equipment
 - Procured as commercial grade,
 - Maintained and tested in accordance with guidance in INPO AP-913
 - Maintenance templates are being prepared

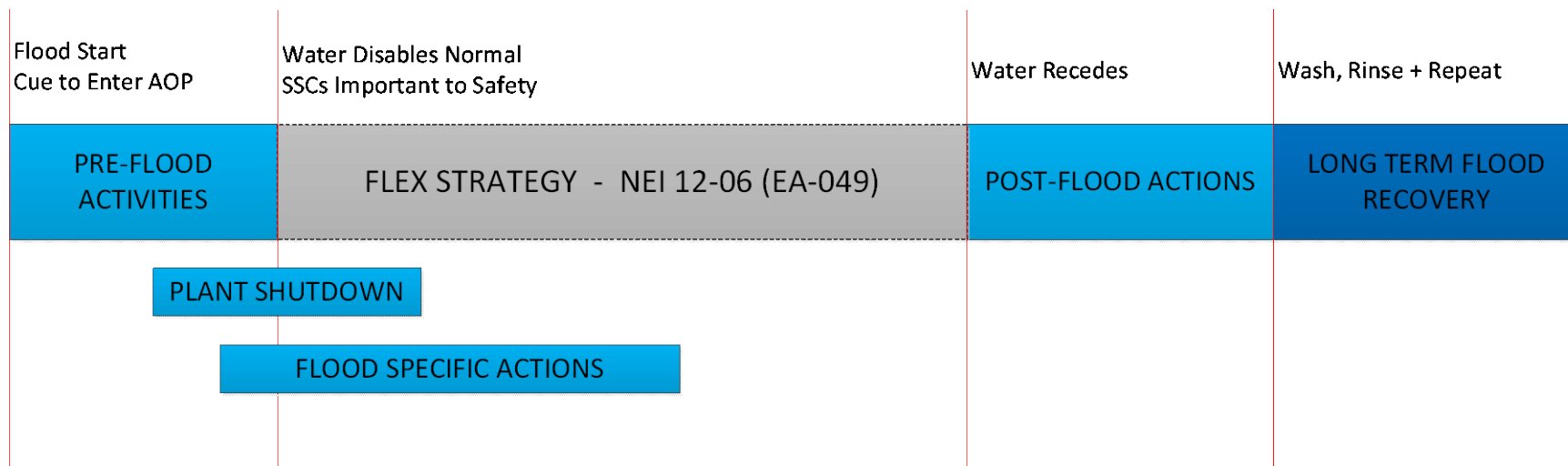
Crediting FLEX



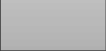
- Approach: If FLEX is part of the strategy to mitigate higher flood levels
 - Determine if FLEX can be implemented given the parameters associated with the new HRR (e.g., flood level, wind speed, Waves, duration, etc.)
 - If it can,
 - Modify FLEX implementation as necessary to accommodate the new input
 - Perform the IA by
 - Crediting the updated FLEX design performed iaw NEI 12-06
 - Using the ISG to evaluate all aspects of the flooding response not covered in the FLEX strategy (e.g., barriers, etc.)

Crediting FLEX

- If the FLEX strategy cannot accommodate the new flood parameters, apply the ISG process to
 - The FLEX strategy and
 - All parts of the flood response strategy beyond FLEX implementation

Crediting FLEX



-  Flood Specific Actions requiring HRA under Appendix C
-  Long Term Actions requiring HRA under Appendix C
-  HRA not required – Guidance followed in NEI 12-06

Crediting FLEX

- Effect on scenario based example
 - Equipment identified as “SFMS” and associated actions will become the FLEX strategy
 - Procedural guidance for SFMS operator actions and training will be in accordance with NEI 12-06
 - of this equipment and actions would not be necessary; instead their design would be revised to accommodate the HRR parameters and credited with no further evaluation.
 - Equipment and operator actions that are part of the FLEX strategy would not need to be evaluated in accordance with APPs A and C

HRA

- Concern
 - IA ISG seems to be based on a design basis standard as opposed to “Reasonable Judgment”
 - Requires evaluating to a limit including uncertainties to prove feasibility and also include time margins to prove reliability (C.3.2.5 and C.4)
 - PRA standards use mean values
 - An accurate HRA cannot be performed until the applicable procedures are written and operators trained. Procedures are not likely to be completed to support an information request.
 - Procedures and training are PSFs that prove feasibility of an action

HRA

- Consistent with a BDB evaluation, these are suggested changes:
 - C.3.2.5: “For an action to be considered feasible the time available must be greater than the time required when using ~~bounding~~ **mean** values, ~~account for estimating uncertainty and human performance variability.~~”
 - C.4: “For an action to be considered reliable the time available must be greater than the time required when using upper bound values (accounting for estimating uncertainty and human performance variability). An action with a margin of 2 between time available and mean time required is always considered reliable.”

HRA

- Approach
 - Use reasonable simulation and mean values without assuming limiting values
 - Use adequate justification or reasonable simulation instead of specific criteria for PSF combinations, reliability margins, and uncertainties

HRA

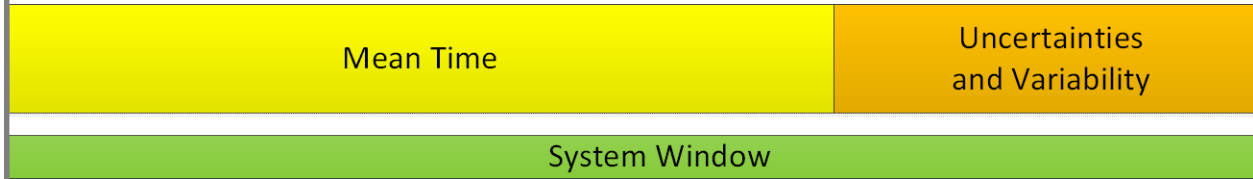
- Affect on scenario based example
 - Any “SFMS” actions associated with FLEX implementation would not require a separate HRA
 - Flood preparation actions (PF-001 through 005) remain unchanged
 - For flood specific actions not currently in the example or FLEX implementation strategy
 - Perform timing evaluations of actual performance by several teams.
 - Determine mean times required
 - Compare mean time required to time available from warning to flood arrival on site
 - Time available > mean time required? If yes, feasible.
 - Time available > 2 * mean time required? If yes, reliable.
 - If no, evaluate uncertainties based on reasonable judgment and add to mean time required
 - Time available > mean time required plus uncertainties? If yes, reliable

HRA

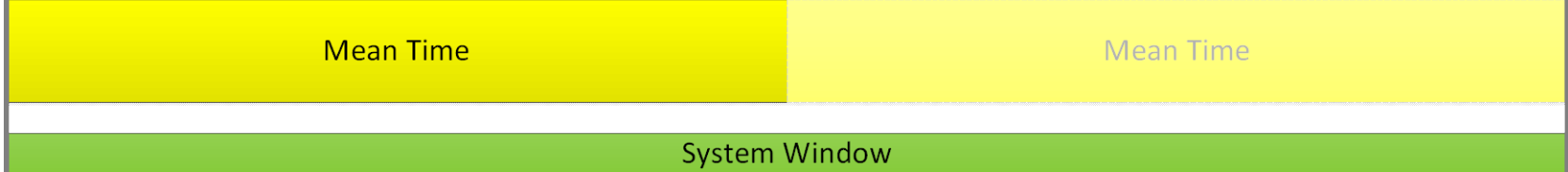
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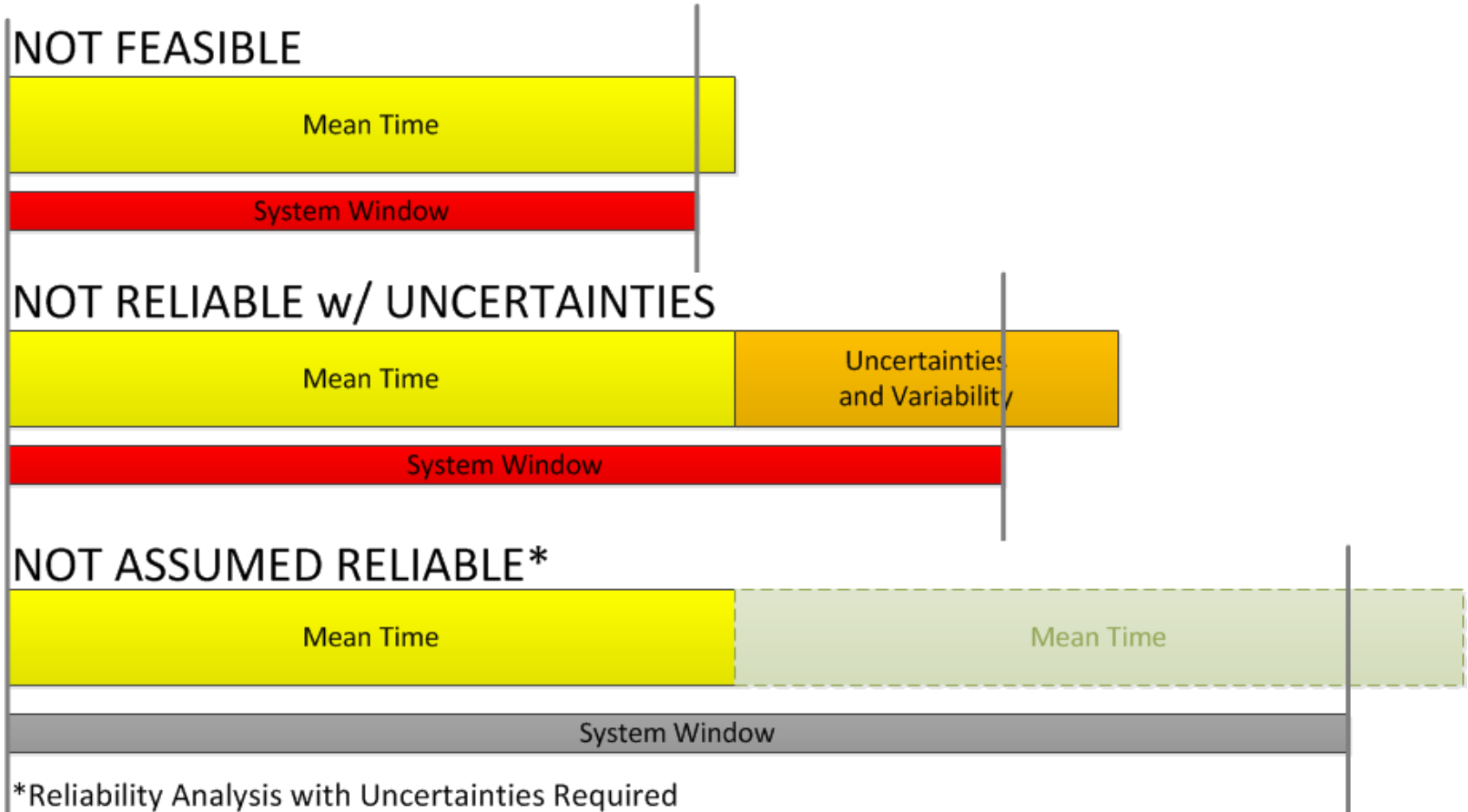
RELIABLE w/ UNCERTAINTIES



RELIABLE w/ ADEQUATE MARGIN (100%)



HRA



IA Trigger and Scope

- Situation:
 - Flooding CDB confirmed by design basis walkdowns
 - HRR includes one or more associated effects that are not specifically addressed in the CDB. All other aspects of the flooding CDB bound the HRR.
- Concern
 - IA effort should be focused on only what is necessary to understand the hazard's effect on the site
 - Not necessary to evaluate an entire hazard if only an associated effect has changed

IA Trigger and Scope

- Approach
 - Initial scope of the IA is just the new associated effect(s)
 - Justification provided to support the scope decision
 - Address all aspects of the associated effect such as dynamic loads on barriers and seals, affect on operator actions, etc.
 - All challenges to flood protection features, SSCs and manual actions must be addressed completely including propagated effects
 - Final IA scope depends upon results

IA Trigger and Scope

- Example
 - Coastal storm surge. CDB flood height is 10 feet and is silent on associated effects. HRR results in a total flood height of 9 feet including still water of 8 feet, wind driven wave runup of 1 foot and debris effects.
 - IA will address all requirements of the ISG such as the following, but limited to the above associated effects
 - Dynamic effects of wind driven wave runup and debris on barriers, seals and operator actions
 - Scouring, sediment deposition, erosion, and other effects arising from wind driven waves or debris
 - Effect of waves and debris on ability to move around site
 - All information required by the 50.54(f) letter including margin
 - Any identified challenges to any SSCs or operator actions must be fully evaluated

FAQ 030: APM Determination

- FAQ 030 (APM determinations) is applicable to passive barriers, doors, and seals
- Process
 - Define what is a “small” APM
 - Determine APM
 - Determine numerical value for all applicable features reflecting the difference between the CDB flood height and the point at which the flood protection feature is compromised
 - If APM for a barrier is unknown
 - Declare APM “Undetermined” and assess the ability of the barrier to withstand a flood equal to the CDB flood plus “small” APM. If the barrier can withstand this event, the barrier APM is not “small”.
 - APM for seals in a barrier can be the same as the barrier or can be based on seal ratings
 - Follow FAQ 006 for large APMs
 - If APM is small, follow guidance in NEI 12-07

FAQ 030: APM Determination

- Closure
 - Document APM determinations or verify that existing walkdown documentation is sufficient
 - Submit letter to NRC confirming that the intent of NEI 12-07 and FAQ 030 is met
 - Retain APM documentation with flooding walkdown records