



GEH Perspective on Part 53 Licensing

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July 21, 2022



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GEH Advanced Reactors

GE Hitachi is supportive of development of a risk-informed, performance-based licensing process.

GE Hitachi is currently supporting two reactor designs being proposed under a 10 CFR Part 50 licensing process. Both plants utilize passive and inherent safety features extensively. The two designs would currently be processed under different Part 53 “Frameworks”:

- *Supporting TerraPower and the Sodium Sodium-Cooled Fast Reactor, which is utilizing the Licensing Modernization Project (LMP) process, and would be under Framework A.*
- *The BWRX-300 LWR is being developed utilizing a risk-informed IAEA approach (utilizing IAEA SSR-2/1) due to being initially licensed at the Darlington site in Canada. This is currently listed under Framework B.*

Neither would likely utilize the Part 53 licensing as currently proposed, due to the increased burden under Part 53, and minimal benefit to transition from Part 50.

We are proposing several improvements below, followed by some clarification details on the frameworks and the supporting safety analysis (safety case).

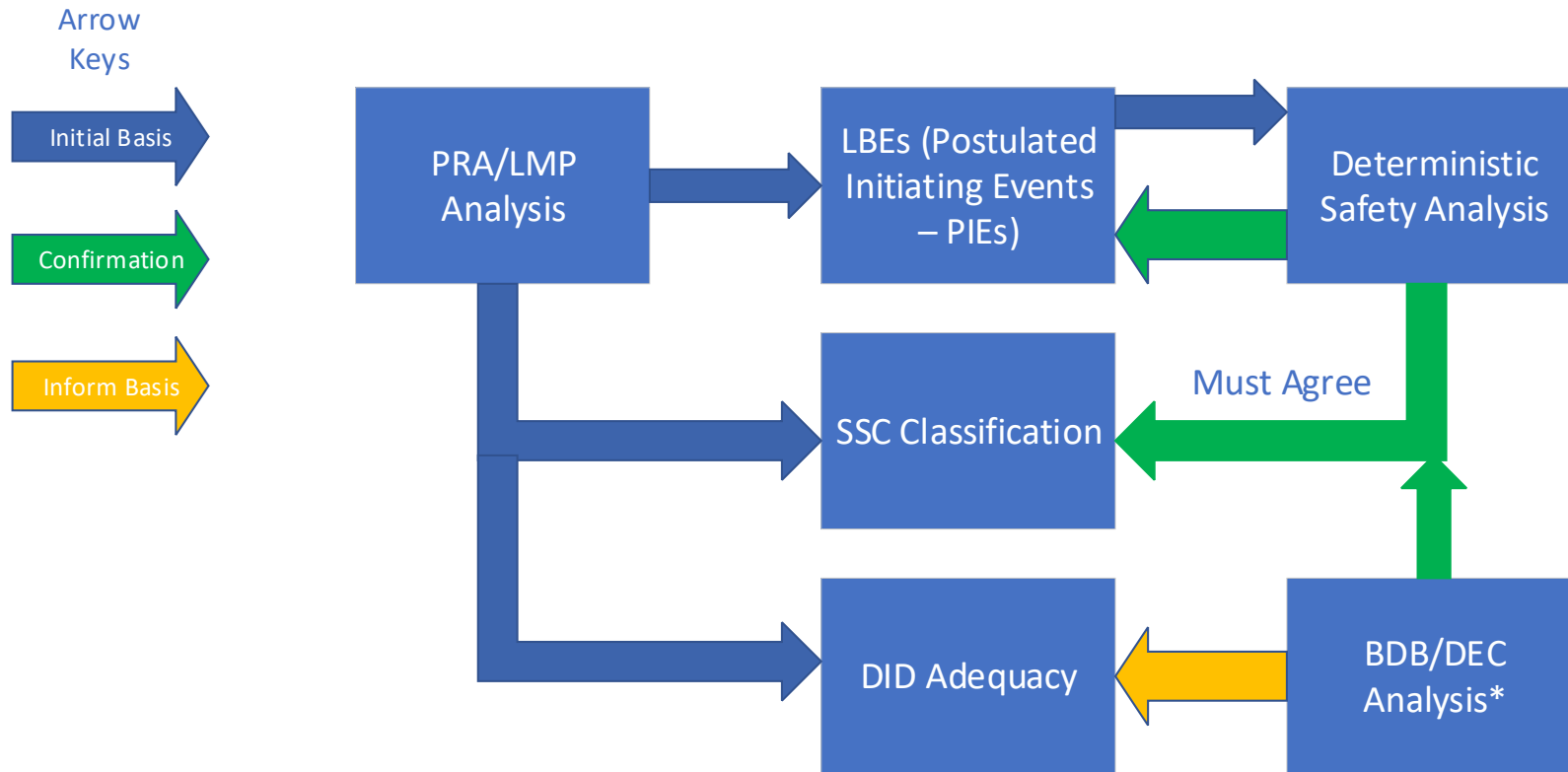


Part 53 Recommendations

1. *A PRA-forward approach, such as a Risk-Informed(RI)-IAEA approach, which has the same basic attributes as LMP, should be included in Framework A since there is little difference between the results/outcome (see the following slides)*
 - a) *This goal should also support the international effort on harmonization of licensing requirements for advanced reactors and SMRs.*
2. *Very few of the sub-parts of Part 53 are risk-informed. The NRC should reconsider the current requirements, with a specific goal of utilizing a RI process. Consider the following question:*
 - a) *“If a reactor has a very small risk contribution for Attribute X (fill in the blank... Fire, combustible gas control, EQ, operator actions, etc.), are the requirements for the Attribute different in comparison to a reactor such as the current operating fleet?”*
 - b) *Our review currently indicates none of the sub-parts can answer yes to the above.*
 - c) *One goal of Part 53 should be to result in overall reduction in burden over part 50 for low-risk Advanced Reactors.*



Safety Analysis – LMP Approach (currently Framework A)



* Also gets input from LBEs/PIEs

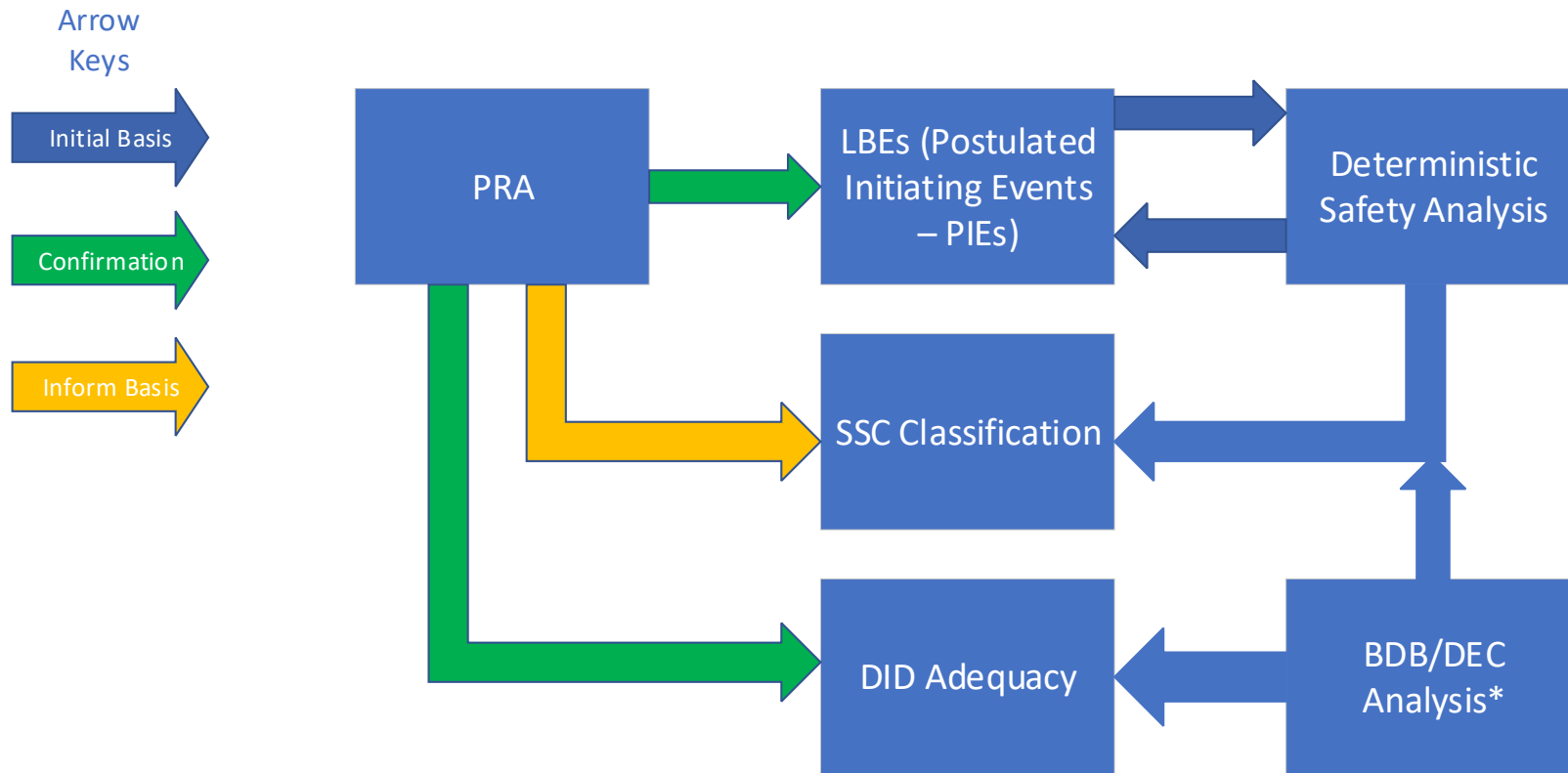
Key Points:

- 1) An LMP Approach still requires a DSA, which must be consistent with the LMP output.
- 2) If the PRA/LMP basis were removed from the results; the analysis could be processed under existing deterministic rules.



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Safety Analysis – using an IAEA Approach (Currently Framework B)



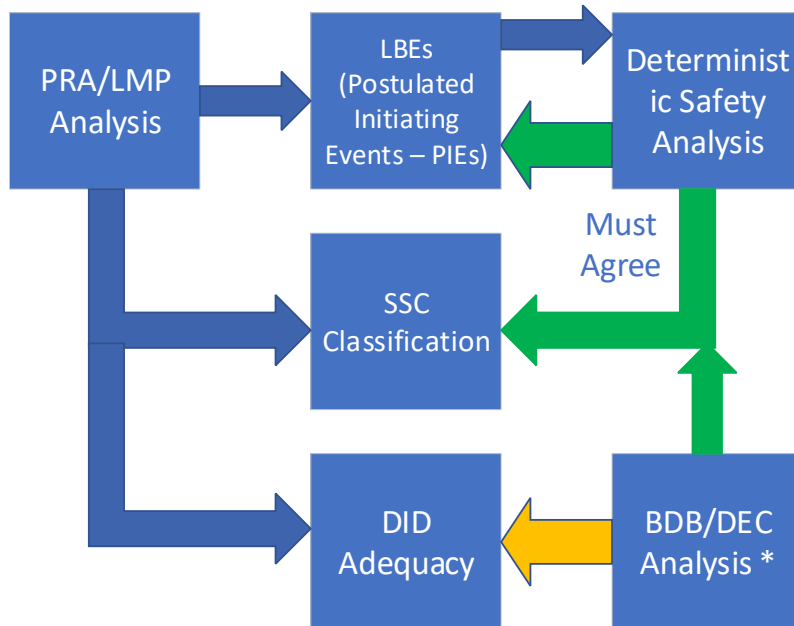
Key Points:

- 1) The IAEA guidance includes use of PRA/PSA to inform or confirm the results from the deterministic analysis. DID adequacy is more rigorous (5 defense levels) than the LMP process.
- 2) The results of the IAEA and LMP approaches would be similar, with the IAEA approach being slightly more conservative for SSC classification.

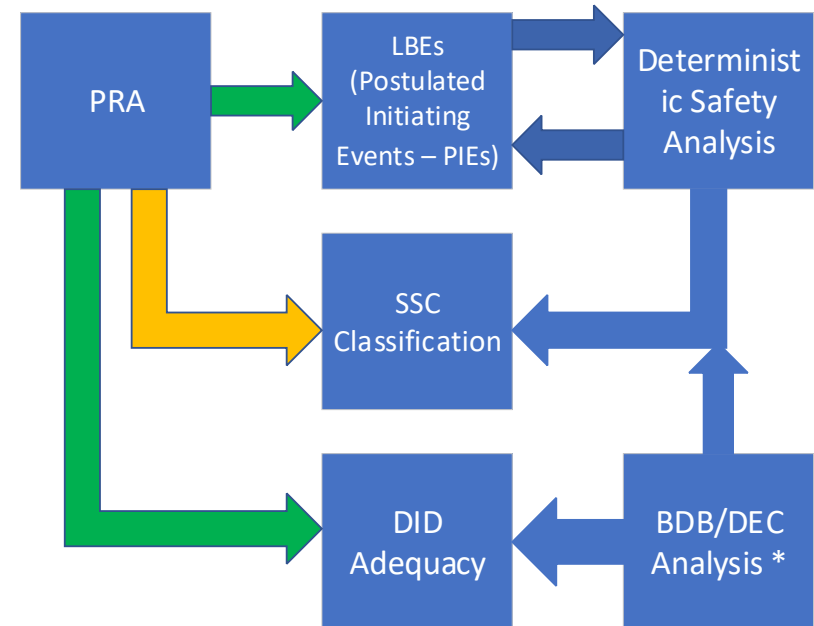


Framework A and B Safety Analysis Comparison

LMP Approach (currently Framework A)



Risk-Informed IAEA Approach



Key Point:

- 1) The outcome of the two processes above are similar – and can be generalized as a deterministic safety analysis that is harmonized with the PRA/PSA, with a detailed DID evaluation.



Acronym List

BDB – Beyond Design Basis

DEC – Design Extension Condition

DID – Defense In Depth

DSA – Deterministic Safety Analysis

IAEA – International Atomic Energy Association

LBE – Licensing Basis Event

LMP – Licensing Modernization Project (see NEI 18-04)

PIE – Postulated Initiating Event

PRA/PSA – Probabilistic Risk Assessment/Safety Assessment

RI – Risk-informed

SSC – Systems, Structures and Components

