

TECHNICAL ANALYSIS OF OPTIONS TO PREVENT LAND CONTAMINATION

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Neil M. Wilmshurst

**Vice President & Chief Nuclear Officer
Electric Power Research Institute**

The Question...

What are the best operational strategies to prevent land contamination?

- Re-phrased question leads to deeper understanding of the issue.**
- Informs development of SAMGs and development of other beyond design basis capabilities.**

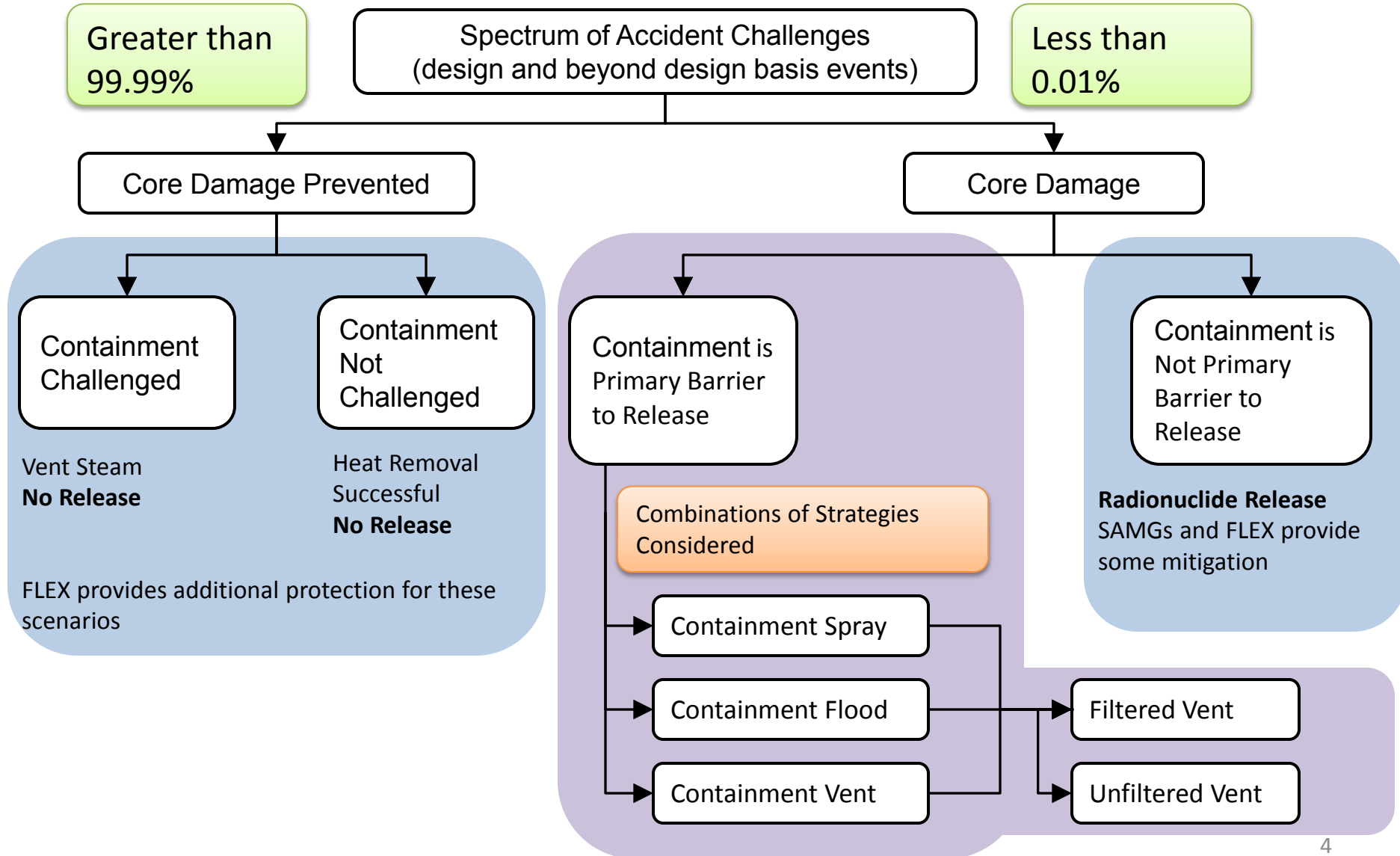
Results published

Technical Report:

“Investigation of Strategies for Mitigating Radiological Releases in Severe Accidents - BWR Mark I and Mark II Studies“

Report 1026539, September 2012

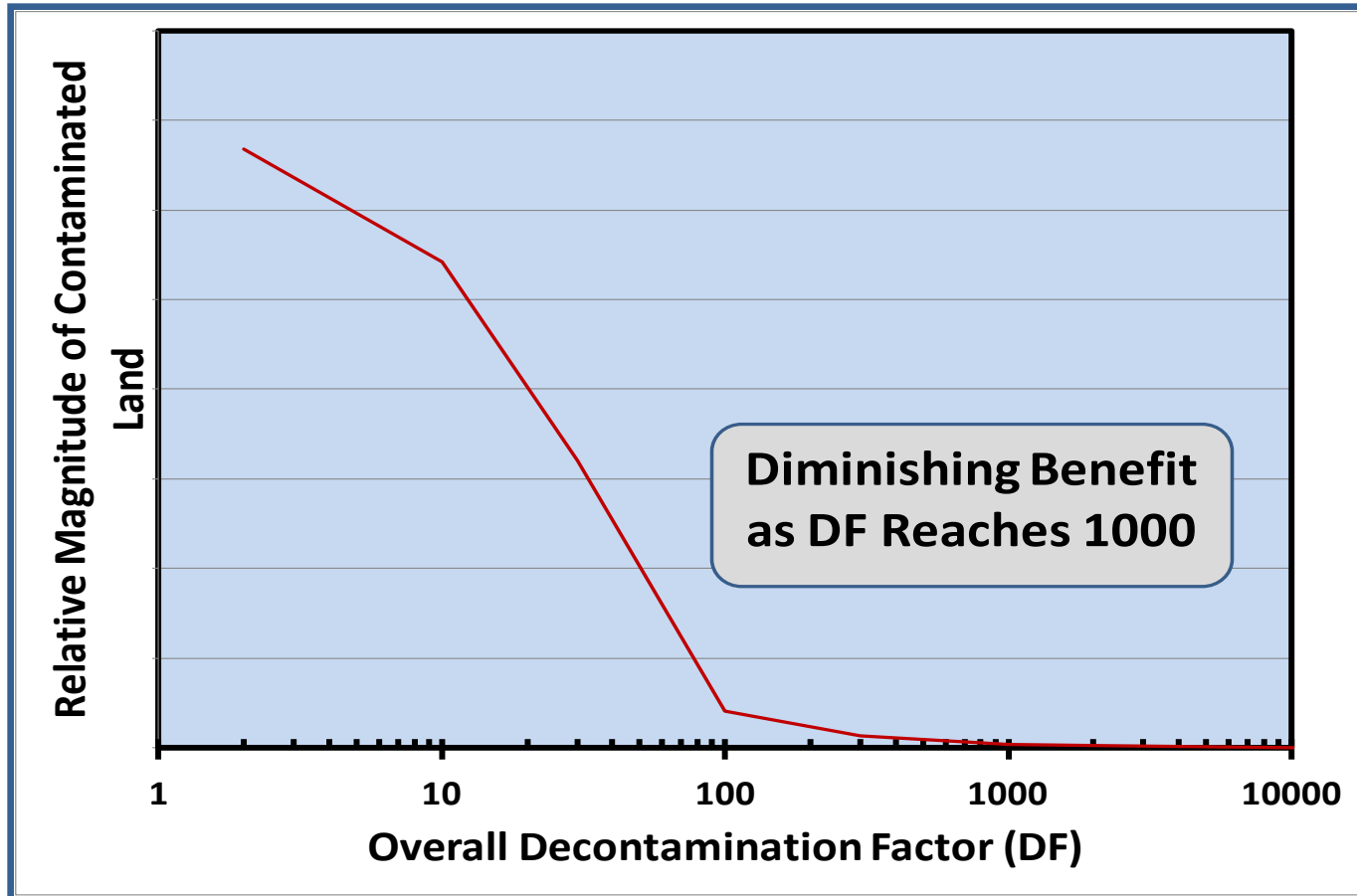
Scope - BWR Mark I and Mk II



Post Accident Actions

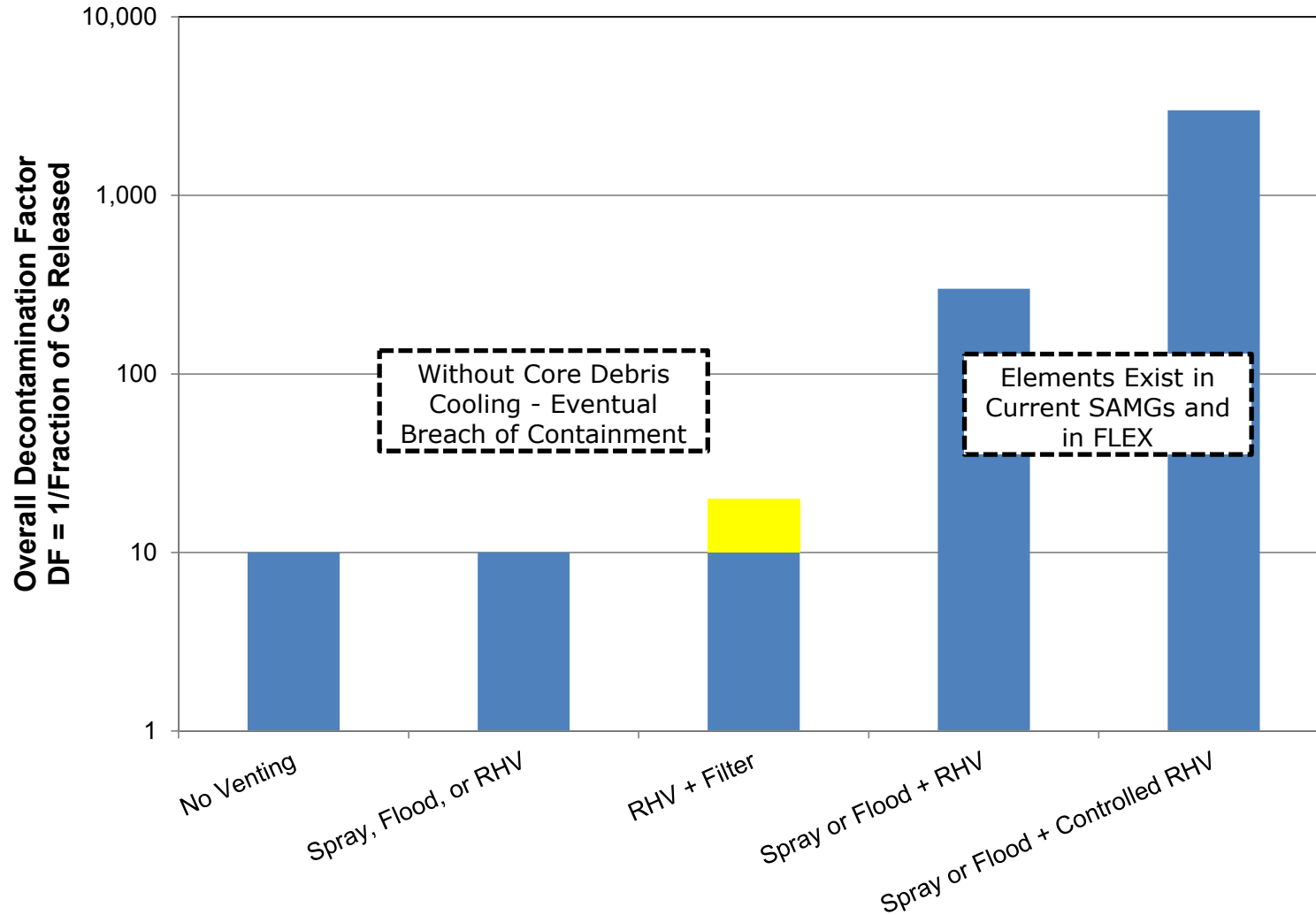
- **Avoid core damage.**
- **If core damaged – cool damaged core.**
- **If core exits vessel - protect containment:**
 - **Cool corium**
 - **Vent when needed**
 - **Remove radioactive material from gas stream**

Decontamination Factor

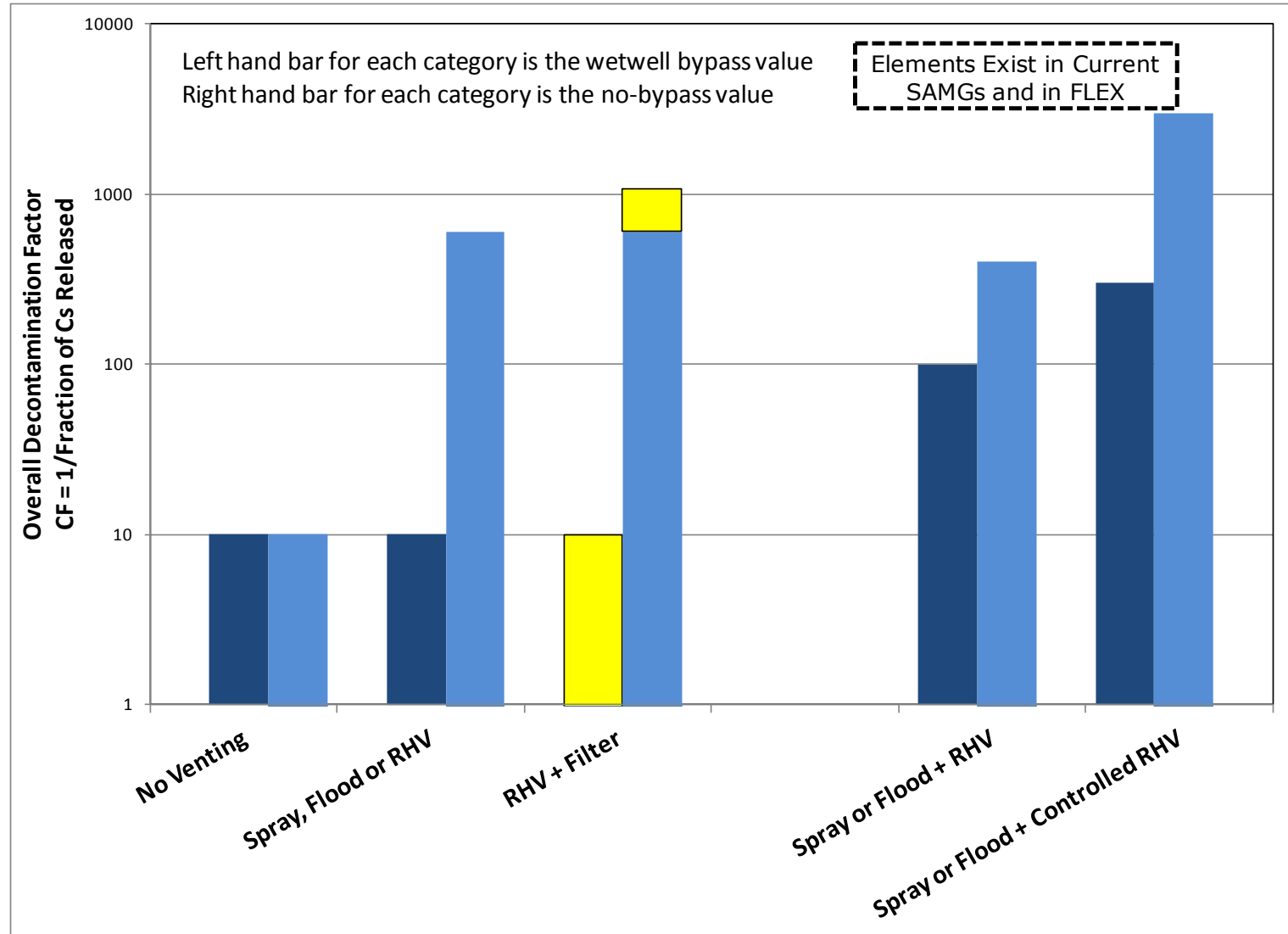


(DF = 1 / fraction of cesium released)

BWR Mark I Results



BWR Mark II Results



Significant Conclusions

- **Maintain containment integrity.**
- **Water injection into containment cools debris and filters potential releases:**
 - **Water spray and flood filter airborne aerosols**
 - **Cycling of vent maximizes aerosol capture and manages hydrogen**
- **Decontamination factor greater than 1000 can be achieved.**

Impact on Plants

- **Specific plant evaluations required.**
- **Plant modifications may be needed:**
 - **Ensure post accident spray and/or flood**
 - **Wetwell and drywell vents required**
 - **Mark II pedestal drains may require protection**
 - **Possible addition of filters on plant specific basis**

Acronyms

- **FLEX – Diverse and Flexible Coping Strategy**
- **DF- Decontamination Factor**
- **SAMG – Severe accident management guideline**
- **RHV – Reliable hardened vent required by EA-12-050**