

# Severe Accident Management Guidelines

## Technical Basis Report

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**Commission Briefing on the Mitigation  
of Beyond Design-Basis Events**

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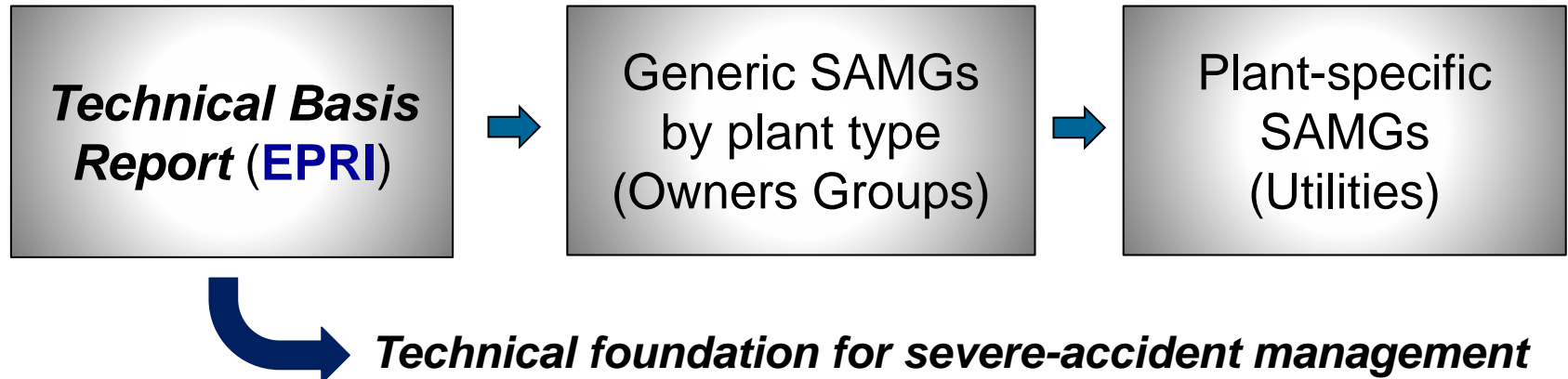
# Severe-Accident Management Guidelines (SAMGs)

## Background

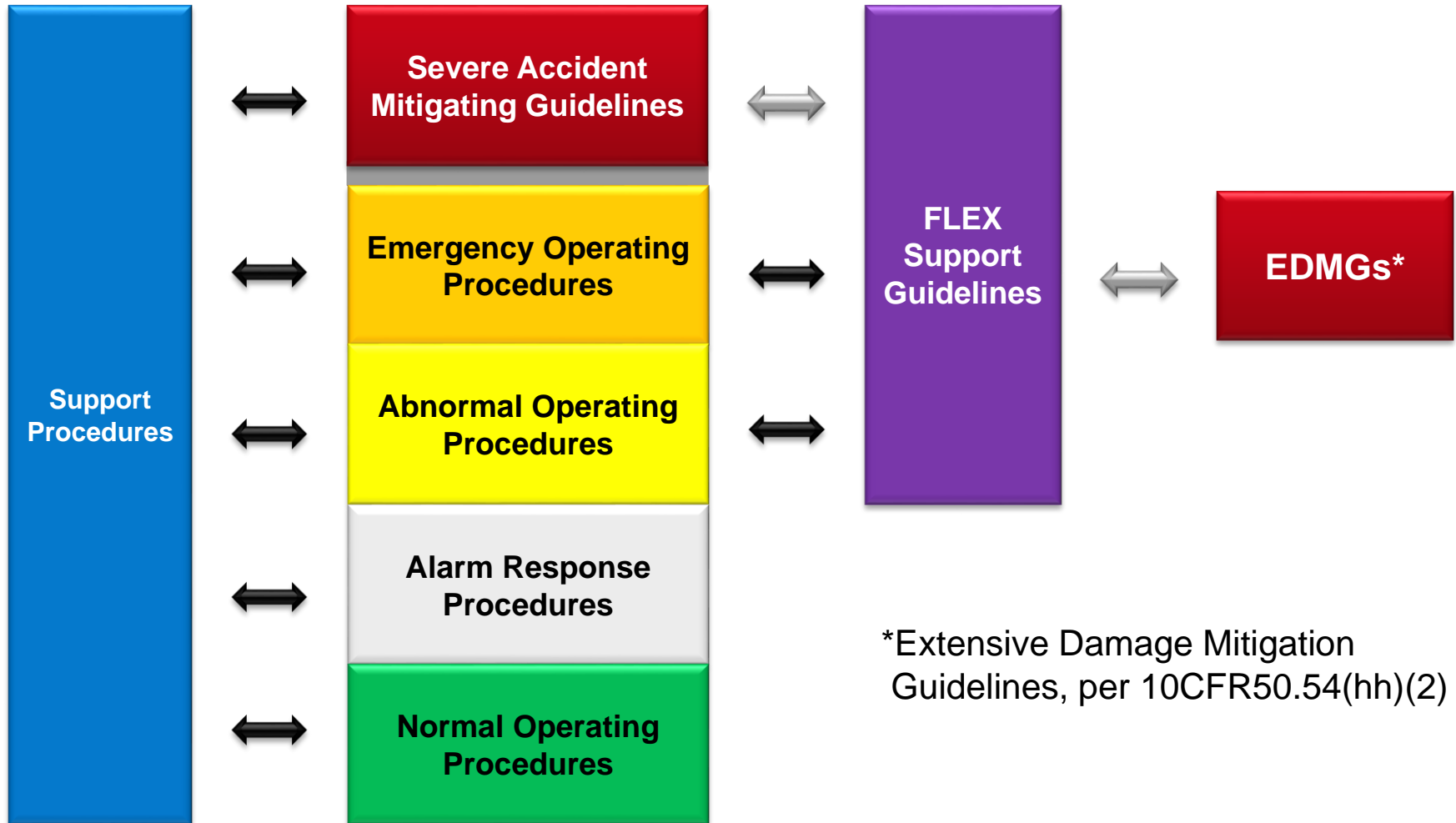
- Context for severe-accident management
  - Set of actions to limit effects of an accident that results in significant damage to fuel
  - Focused on stopping progression of fuel damage and limiting releases to the environment
- Nature of severe-accident management guidelines
  - Delineate strategies for response to symptoms of a severe accident
  - Traditionally, rely on use of
    - Existing equipment
    - Existing instrumentation – with alternatives or compensatory measures as necessary

# SAMGs – Background

- Nature of SAMGs (continued)
  - Emphasis is on use by Technical Support Center to advise control room staff
  - Guidelines (rather than step-by-step procedures) to provide flexibility to address a broad range of possible condition
- Origin of the SAMGs
  - Originally developed as part of long-term response to TMI-2 accident
  - Overall process:



# Where do SAMGs Fit Relative to Plant Procedures?



# Updating of Technical Basis Report (TBR)

## Objectives

- Address major insights from Fukushima Dai-ichi accidents
- Review other information from severe-accident research and analysis and incorporate as necessary

## Milestones

- Technical revisions completed Summer 2012
  - Extensive interaction with Owners Groups throughout development to facilitate updates to SAMGs
- Publication (EPRI 1025295) October 2012

# Update of Technical Basis Report

## Organization/content of the TBR

- **Volume 1:** Candidate High-Level Actions (CHLAs) and Their Effects
- **Volume 2:** The Physics of Accident Progression

## Nature of revision to TBR

- Minor updating of many sections
- Major updates to some sections
- New sections to address additional phenomena or accident considerations



# Update of the TBR – Volume 1

- Enhanced discussion of existing candidate high-level actions
  - Expanded description of relevant accident signatures
  - Identified thresholds for taking action
- Additional (new) candidate high-level actions
  - Operation of isolation condenser (BWRs)
  - Makeup and cooling of spent fuel pool
  - Venting/ventilation of the reactor or auxiliary building
- Candidate high-level actions address
  - General insights, including
    - Implications of accidents initiated by external events
    - Consideration of shutdown states
    - Challenges and priorities for multi-unit accidents
  - New and expanded treatment of phenomena in Volume 2



# Update of the TBR – Volume 2

- Goals for the Volume 2 update:
  - Address phenomenological insights from the Fukushima Dai-ichi accidents
  - Include additional insights gained from experiments performed since the initial TBR version was completed
  - Include insights gained from plant-specific analyses developed using the initial TBR
- Phenomena of interest from Fukushima Dai-ichi include
  - Influence of using seawater to cool the reactor core
  - Multi-unit effects
  - Possible influence of the venting configuration
  - Effects of potential accident conditions on the spent fuel pool
  - Effects of radiolysis and corrosion with respect to formation of hydrogen



# Summary & Conclusions

- Guidance in original Technical Basis Report remains valid and useful
- Updated TBR was valuable in developing enhanced SAMGs
  - Both the PWROG and BWROG engaged throughout updating of the TBR
  - For timely revision of the SAMGs, technical information from TBR was factored into owners groups' updates as TBR evolved
- Future revisions to TBR
  - Currently tracking relevant developments (e.g., extensive investigation of mitigating strategies to limit serious releases)
  - Expect next version after further forensic examination of Fukushima Dai-ichi reactors

