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YUCCA
MOUNTAIN
PROJECT

Studies

Process Model Reports (PMRs)

Presented to:
DOE/NRC Technical Exchange on
Total System Performance Assessment

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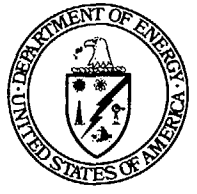


U.S. Department of Energy
Office of Civilian Radioactive
Waste Management

May 25-27, 1999

Legacy

Process Model Reports (PMRs) Purpose

- The purpose is to document the technical basis supporting each TSPA process model
  - Supports the postclosure safety case for SR/LA
- PMRs will focus the development of technical information on what is relevant to developing a defensible TSPA
  - i.e., the information the Project is relying upon to demonstrate postclosure compliance
- The PMR development process will ensure traceability of data, information, and references

PMR Scope

The following PMRs will be developed

1 Integrated Site Model

2 Unsaturated Zone Flow and Transport

3 Near Field Environment heat effects water chemistry

4 Engineered Barrier System Degradation and Flow/Transport

5 Waste Package Degradation

6 Waste Form Degradation cladding degradation

7 Saturated Zone Flow and Transport

8 Biosphere

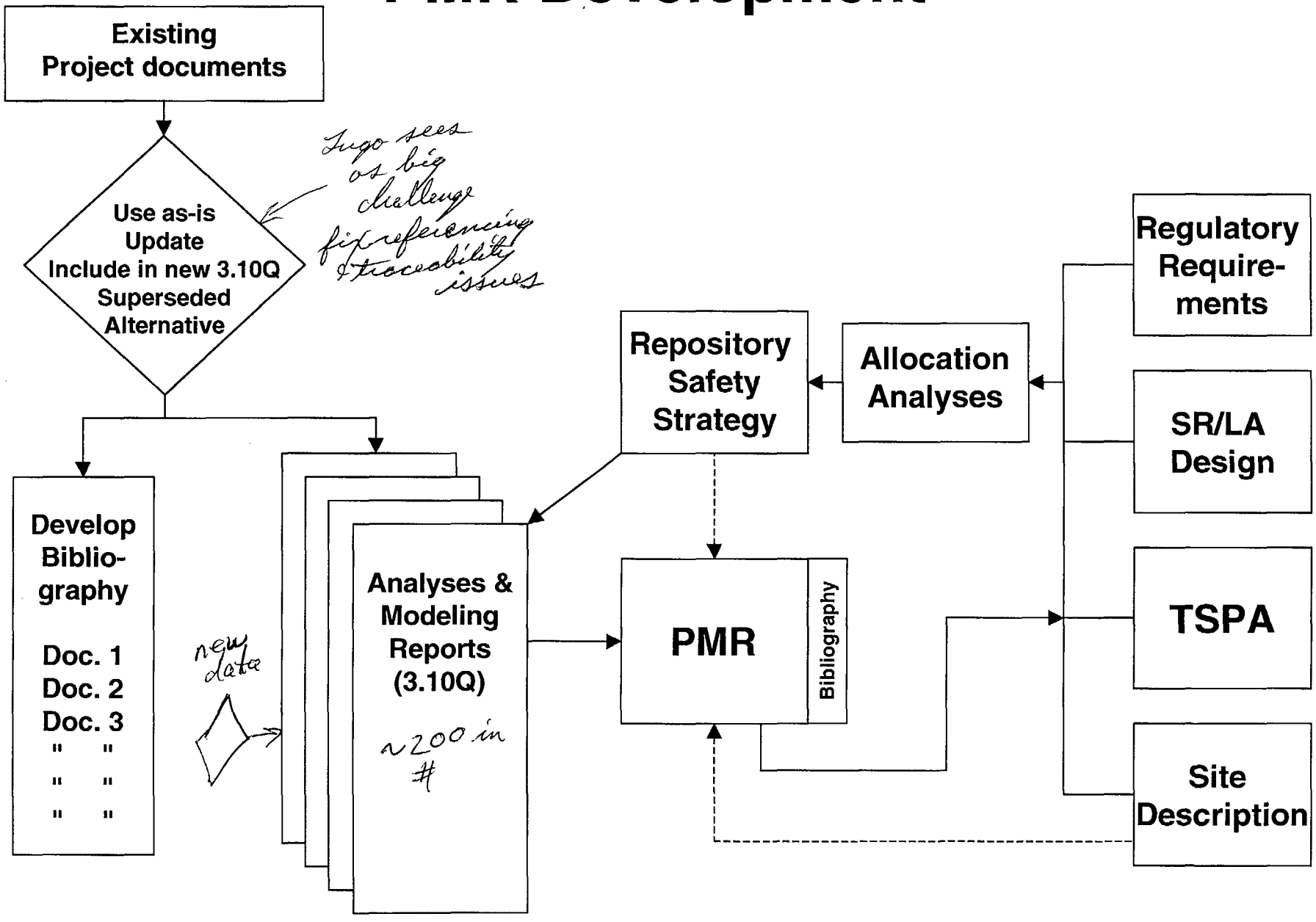
9 Tectonic Hazards seismic and volcanic consequences

criticality/human intrusion direct inputs into PA

PMR Scope
(Continued)

- **PMRs will contain:**
  - Descriptions of the models, submodels, and abstractions
    - » Relationship to principal factors
  - Relevant data and data uncertainties
  - Assumptions and bases
  - Model results (outputs)
  - Code verification/model validation information
  - Opposing views – how differs from opposing view in literature and within project
  - Information to support regulatory evaluations
    - » NRC Key Technical Issues

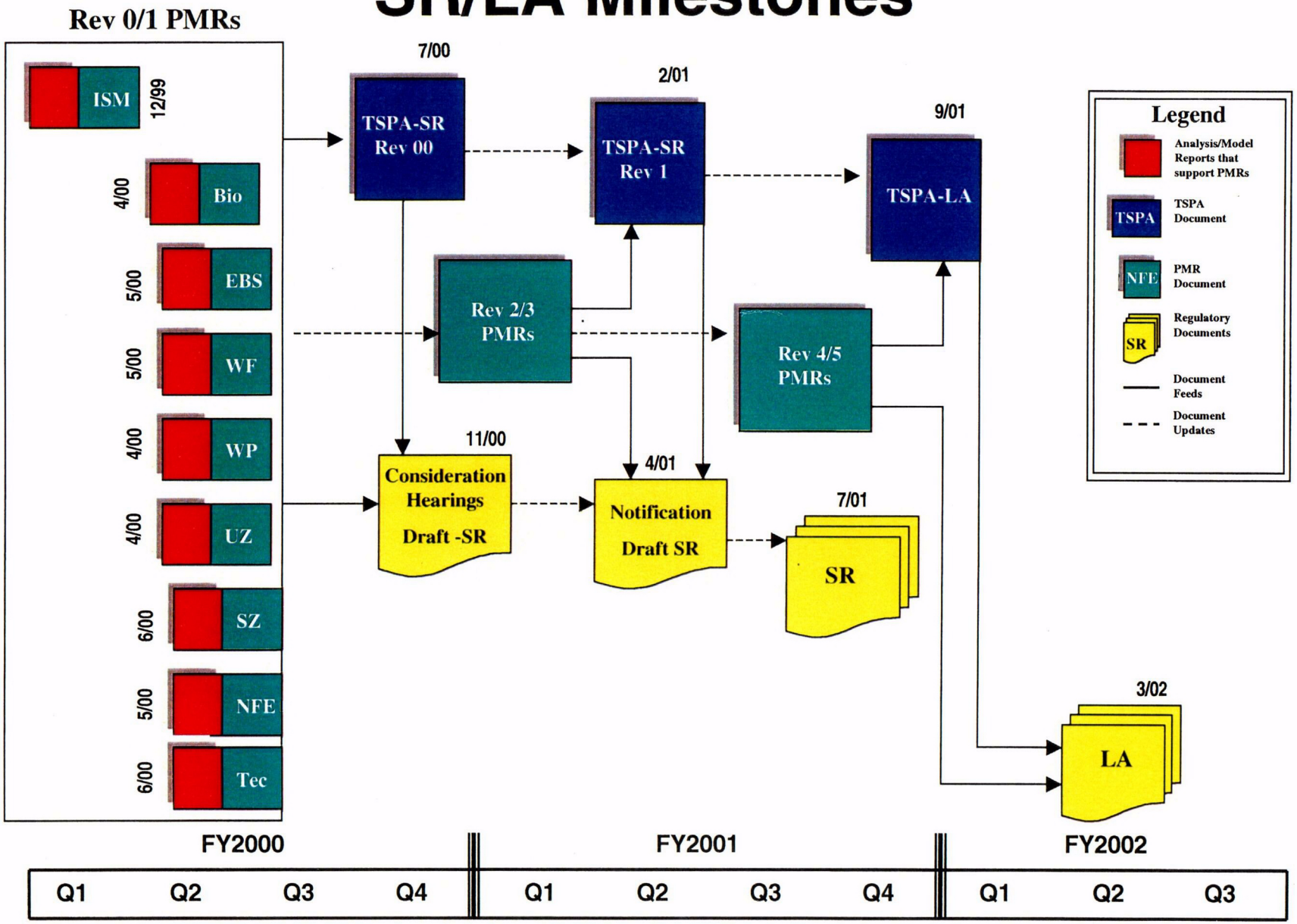
PMR Development



Examples of Analyses & Model Reports

- **UZ Flow and Transport PMR** (35 supporting ~~AMRs~~ AMRS → includes abstractions)
  - Climate model
  - Infiltration model
  - Seepage model
  - Analysis of fracture and matrix properties data
  - Mountain-scale coupled processes
  - Radionuclide Transport model
- **Waste Package Degradation PMR**
  - General corrosion of waste package barrier
  - Localized corrosion model
  - Stress corrosion cracking model
  - Juvenile failures

Linkage of Major Programmatic SR/LA Milestones



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Summary

- The PMR process is being implemented to ensure traceability and transparency of models
  - Will document the technical basis for TSPA process models
- PMRs, and supporting analyses and model reports, will address the principal factors of the safety case
  - Focus will be on those factors most significant to performance
- The PMR schedule allows for information to be incorporated as it becomes available