



U.S. Department of Energy



Preclosure Seismic Hazard

Presented to:

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Site-specific Seismic Hazard

- **Three values of ground motion currently used for preclosure design analyses:**
 - **Design Basis Ground Motion #1 (DBGM-1): MAPE 10^{-3} or 1,000 year return period**
 - **Design Basis Ground Motion #2 (DBGM-2): MAPE 5×10^{-4} or 2,000 year return period**
 - **Beyond Design Basis Ground Motion (BDBGM): MAPE 10^{-4} or 10,000 year return period**
 - ◆ **Equivalent to a Review Level Earthquake**
- **Design ground motions, developed per NUREG-6728 Approach 2b by enveloping over epistemic uncertainties in site-response inputs and range of alluvium thickness, contain some unquantified degree of conservatism**

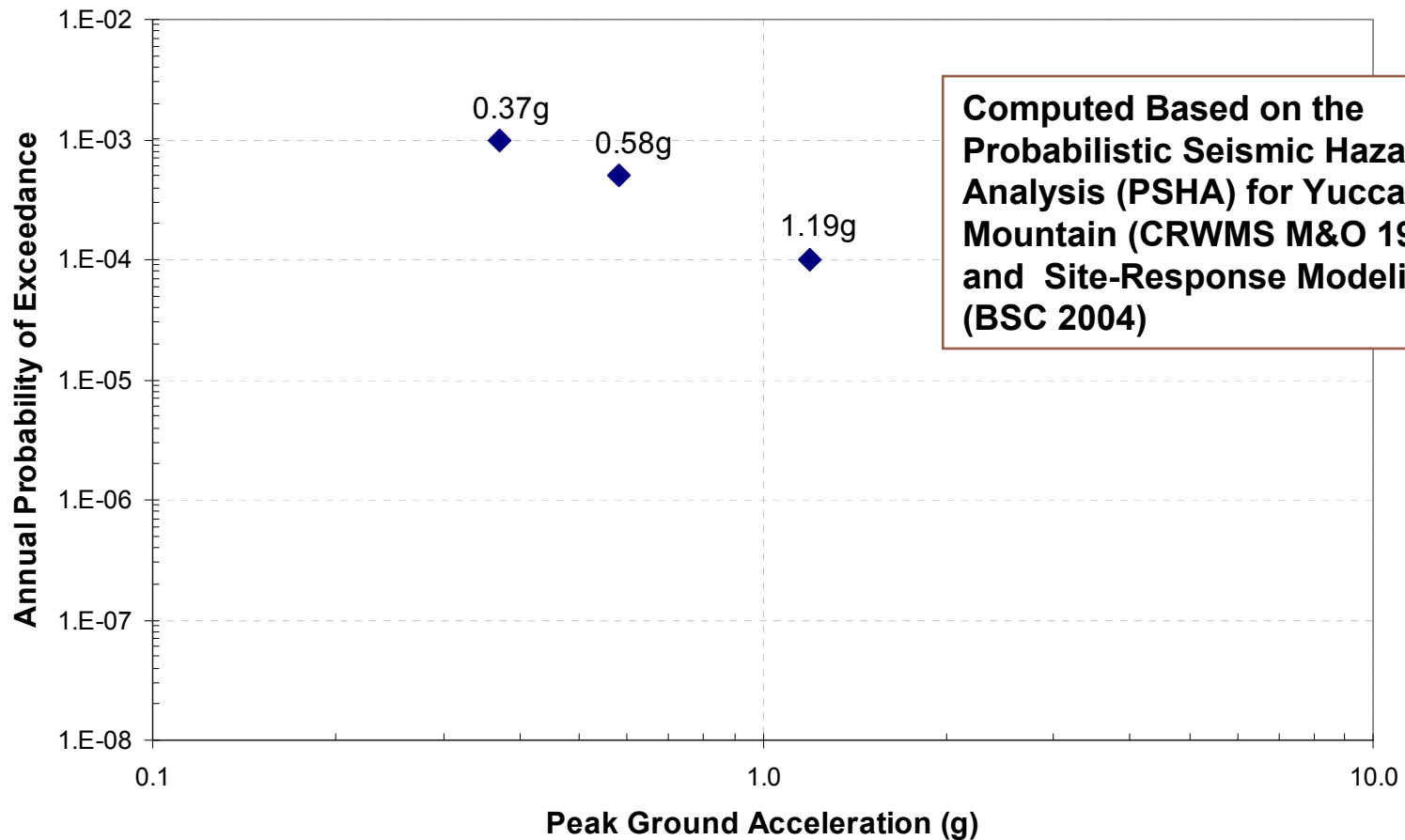


MAPE = Mean Annual Probability of Exceedance



Existing Hazard Points

Design Horizontal Peak Ground Acceleration for the Surface Facilities Area



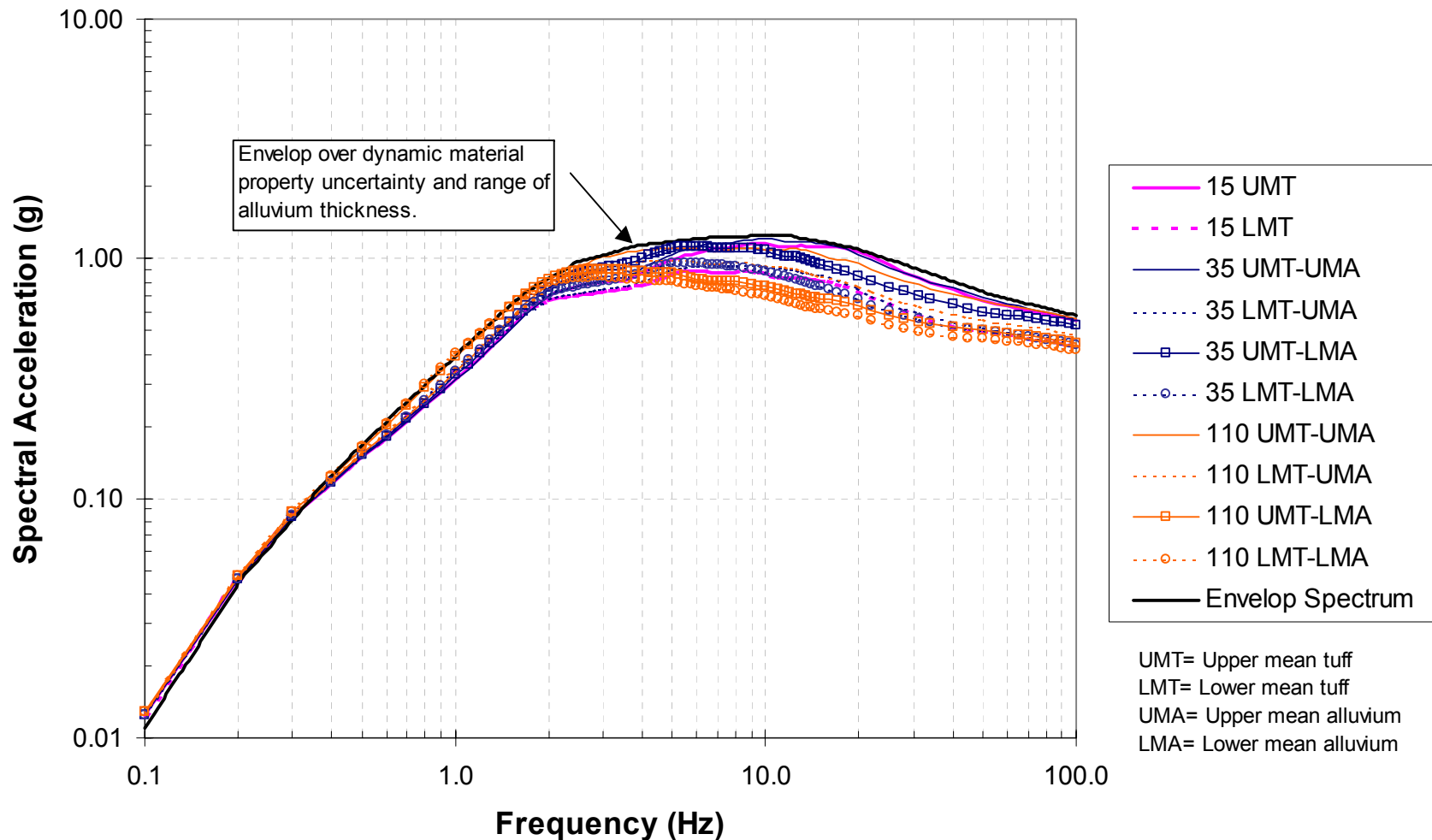
CRWMS M&O 1998. Probabilistic Seismic Hazard Analyses for Fault Displacement and Vibratory Ground Motion at Yucca Mountain, Nevada. Milestone SP32IM3, September 23, 1998. Three volumes. Las Vegas, Nevada: CRWMS M&O.

BSC (Bechtel SAIC Company) 2004. Development of Earthquake Ground Motion Input for Preclosure Seismic Design and Postclosure Performance Assessment of a Geologic Repository at Yucca Mountain, NV. MDL-MGR-GS-000003 REV 01. Las Vegas, Nevada: Bechtel SAIC Company.



Spectral Accelerations

5×10^{-4} MAPE



Hz = Hertz (cycles per second); g = Acceleration due to gravity



Site-specific Seismic Hazard

(Continued)

- **DOE will develop a mean hazard curve for surface facilities area for annual probability of exceedance down to approximately 10^{-7} for quantification of probabilistic seismic analyses**
 - Incorporate results of ongoing geotechnical investigations
 - Develop mean ground motion (i.e., without conservative bias)
 - Incorporate knowledge of bounds to ground motion experienced at Yucca Mountain (e.g., geologic observations; seismic observations)



Full Hazard Curve Example

Hazard Curve for Surface Facilities Area

