



**Impacts on Structural Design from New
Ground Motion Predictions – Review
Framework and Technical Challenges**

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Background

- Advances in seismological research have led to updated Source Characterization for earthquakes in the CEUS.
- Predicted Ground motions from the updated model for rock sites in the CEUS show increased energy at frequencies > 10 Hz.
- Updated ground motion spectra at higher frequencies may exceed the Certified Seismic Design Response Spectra
- A new review framework was needed to address these exceedances.

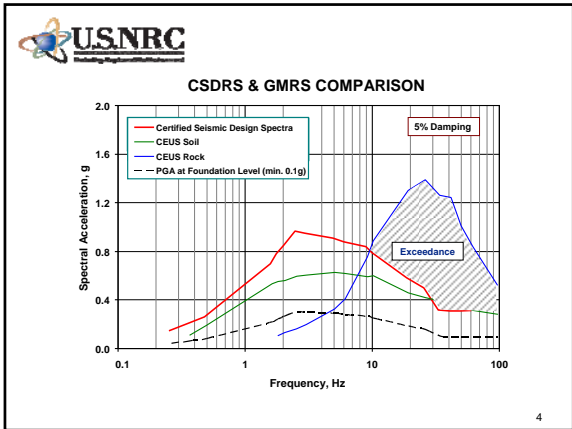
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Definitions

- Certified Seismic Design Response Spectra (CSDRS)
- Ground Motion Response Spectra (GMRS) – site specific
- Peak Ground Acceleration (PGA) at Foundation Level – site specific
- Structures Systems & Components (SSC)
- In-Structure Response Spectra (ISRS)

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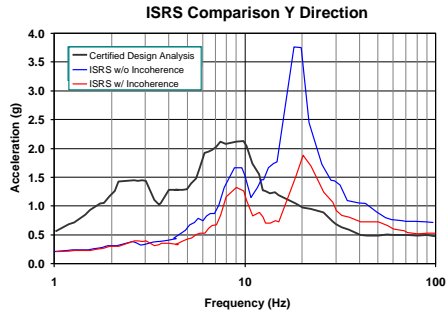


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- Review Approach**
- A framework to address the issue was developed and incorporated in the SRP
 - The staff issued interim staff guidance (ISG) to implement the SRP framework.
 - The ISG specifies acceptable incoherency approach.

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- Review Approach (Contd.)**
- IF CSDRS > GMRS – OK
 - IF Not - Detailed SSI Analysis and Compare site specific ISRS with the design basis ISRS
 - IF Not OK – Further demonstrate acceptability



Comparison of ISRS



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Challenges to the Applicants

- Confirmation of seismic adequacy of SSC when GMRS or ISRS exceeds corresponding CSDRS values at high frequencies.

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Approaches under consideration

- Screening process to identify high frequency sensitive SSC
- Adequacy of structural model
- Use of existing test data
- Generic tests covering frequencies of interest
- Needs to be demonstrated on a design center basis

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Summary

- SRP 3.7 & ISG provides a high frequency review framework.
- AP1000 Topical report has been submitted and currently under staff review
- ESBWR has used CSDRS that envelop both soil and rock sites. Thus no additional assessment is expected
- Resolution of high frequency issues should be addressed on a design center basis

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