

NRC Staff Comments on the Industry's Draft White Paper

During the May 31 meeting, NEI presented the White Paper (referred to herein as the Paper) to discuss the soil dynamic testing issue related to future COL applications. The Paper summarized regulatory requirements and the NRC staff positions in the relevant guidance documents regarding the soil dynamic tests, specifically, the Resonant Column/Torsional Shear testing (RC/Ts). The RC/Ts testing yields soil modulus reduction and damping curves, which are critical data for site response calculation. The Paper also proposed a protocol to accommodate as many COL applications as possible with the consideration of limited testing facilities.

The NRC staff reviewed the paper and found that the protocol addressed in the Paper could be a potential strategy to deal with the shortage of soil dynamic testing facilities. However, the Paper also left some key questions to be answered and key terminologies to be defined. The staff expects the industry to also address the following questions in its application.

- 1) Define a soil site quantitatively in terms of soil dynamic properties (e.g., shear wave velocity and/or shear wave velocity gradient) to make it clear what kind of soil/rock needs to have RC/Ts testing. Furthermore, the paper needs to define hard rock, firm rock, competent rock and deep soil which were referred in the paper frequently with respect to the same criteria.
- 2) What criteria will be used to determine the initial number of testing samples?
- 3) Elaborate on what randomization processes will be used to demonstrate that limited initial sample testing will cover the variation when more sample testing results are available, or if a bounding analysis is used, the choices of the appropriate margin or bounding factor.
- 4) What measures will be taken to incorporate the final results? If the final testing results prove that initial testing results did not provide sufficient safety margins for site-specific soil dynamic properties, explain the potential impact on relevant calculations that are based on limited sample testing.
- 5) If possible, include a case study using limited soil sample testing to characterize the soil dynamic properties.