Draft Outline on JIP for seismic issues about Jackup structures

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Based upon our discussions at the 7 May meeting in Houston we have outlined research questions, experimental issues, and a test program concept scope for a large scale centrifuge test series. This is a strawman to help move the discussion along. Please feel free to edit and add bullets, or begin to develop new sections on slope deformations, anchors, LNG tanks or other seismic issues and return to us or the group for discussion.

JACKUP STRUCTURES

1. RESEARCH QUESTIONS
   - 1.1. Can we accurately predict the settlement of jackup structures due to seismic ground shaking?
     - 1.1.1. Spudcans
     - 1.1.2. Suction caissons
     - 1.1.3. Different soil conditions
   - 1.2. Can we predict seismic dynamic response of jack up platforms during strong ground motions?
     - 1.2.1. Attenuation of accelerations and amplification of displacements in soft soil profiles.
     - 1.2.2. Seismic SSI
       - 1.2.2.1. deck acceleration demands
       - 1.2.2.2. dynamic and residual displacement demands
       - 1.2.2.3. damping associated with foundation deformation
       - 1.2.2.4. displacement demands on conductor and pipeline connections
   - 1.3. Other Research questions – please let us know the most pressing questions
     - 1.3.1. TBD (to be determined)

2. EXPERIMENT DESIGN ISSUES/QUESTIONS
   - 2.1. Assuming installation effects/load paths have a large effect on the behavior, we may need to develop some equipment to model the installation process on the centrifuge.
   - 2.2. How important is the hydrostatic pressure (depth of water above the mudline? How deep must the water be to avoid cavitation in the model test?

3. POSSIBLE CENTRIFUGE TEST PROGRAM SCOPE
   - 3.1. 1st experiment: One model container with two jackup platforms
     - 3.1.1. One platform with spudcans with lower range bearing capacity
     - 3.1.2. Another platform with spudcans in upper range of bearing capacity
     - 3.1.3.
   - 3.2. 2nd experiment: PICK ONE OR TWO OF THESE TOPICS PER EXPERIMENT.
     - 3.2.1. Different soil type (sand, clay, or layered)
     - 3.2.2. Different combinations of natural frequencies spectral content of input ground motions.
     - 3.2.3. Different foundation type (e.g. suction caissons)
     - 3.2.4. Other parameters TBD