and waveform of seismic wave, and it should bring attention to the impact of site type, if necessary, to take certain restrictive measures in the bottom of the tank in order to avoid a large slip and cause damage.

5. CONCLUSIONS

In this paper, four actual seismic waves recorded on four kinds of soil type are taken as input, and horizontal seismic response for an unanchored tank liquid system is studied based on the software of ANSYS. The conclusions are following.

(1)The maximum vertical sloshing displacement on free surface reaches 1.26m under Class-Ⅲ site, which shows obviously the characteristics of long period and is dangerous. It should avoid predominant period of the liquid sloshing be close to the excellent period of the seismic waves, if necessary, it can take some measures to reduce liquid sloshing and prevent spilling of liquid due to the large sloshing.

(2) The obvious elephant foot deformation occurred at 1.2m close the bottom tank. Under the four kinds of sites, all the maximum stress on the tank wall did not reach the yield stress of the material. However, the axial compressive stress near the foot area in Class-Ⅰ and class Ⅳ site conditions exceeds the allowable compressive stress values specified in the code, and resulting in local yield instability failure. It can increase the wall thickness appropriately, and increase allowable compressive stress of tank wall to prevent local buckling failure.

(3) Nonlinear lift-off and slip deformation happened on the tank bottom under the input of four seismic waves, and the maximum lift-off achieves 6.7mm under Class-Ⅰ site, and the slip at the end of the seismic waves reached 23.5mm under class Ⅳ site, which indicates the tank container exists destruction dangerous and may cause leaks of fluid. When the seismic design for tank is carried, it should take some appropriate limit measures to reduce lift-off and slip of the tank.

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