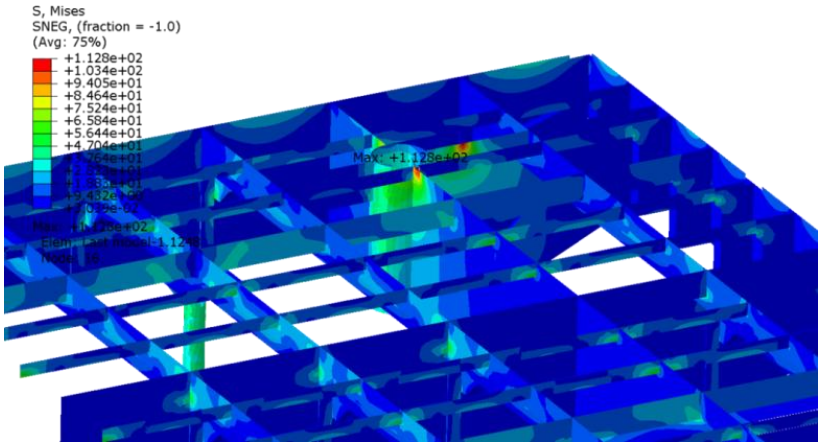

Figure 20 Von mises stress results at 135° crane rotation

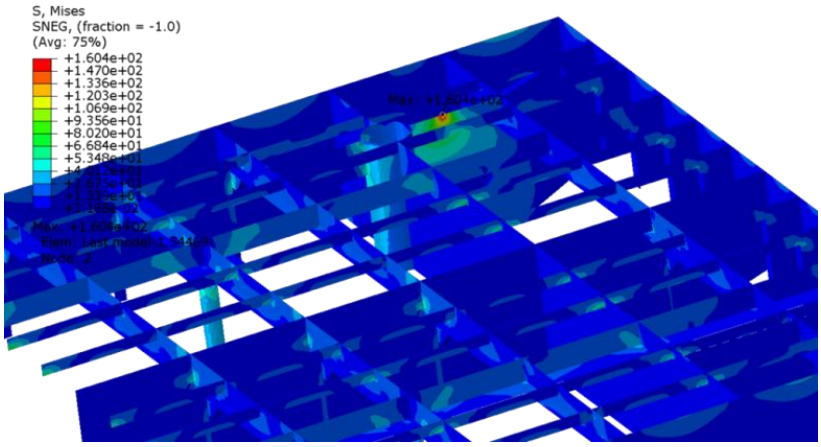

Figure 21 Von mises stress results at 180° crane rotation

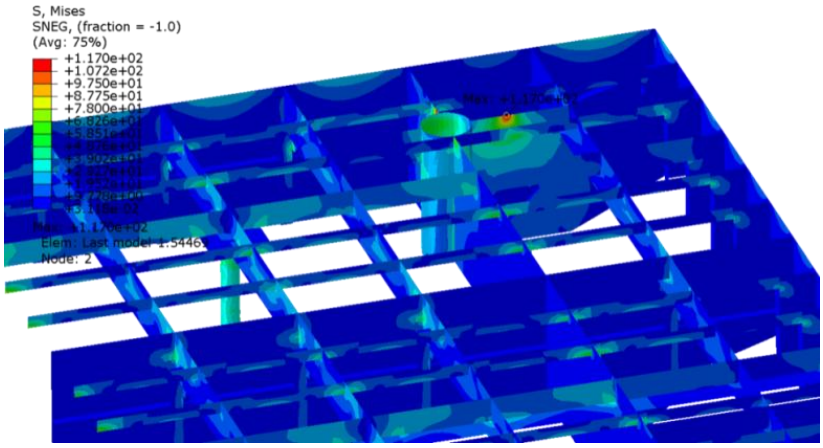

Figure 22 Von mises stress results at 225° Crane Rotation

Repeated crane operation in these unfavorable directions may increase the risk of fatigue damage in welded joints, girder intersections, and pillar-to-deck connections, even if the static stress remains below the allowable limit. This load-sharing mechanism agrees with previous marine structural studies showing that deck plating, longitudinal/transverse stiffeners, and supporting members jointly govern the local stiffness and stress response around crane foundations and similar equipment-support regions. Recent reviews further indicate that repeated loading/unloading, transient operational loading, and welded-detail geometry are among the key factors governing fatigue resistance in ship and offshore structures (Dong et al., 2022).