

## **Numerical simulation to study the response of steel plate submerged in water experiencing UNDEX**

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In this study, an effort is made to simulate the dynamic behavior of a steel plate, which is submerged in water, under high strain rate loading. The response of a plate in water alters (compared to air interaction) based on the drag effect and added mass effect. So, the response chart provided in codal provisions like UFC-3-340-02 cannot be used directly for structures submerged in fluid medium like water. The fluid structure interaction (FSI) analysis is performed using FEA tool ABAQUS. Using coupled Eulerian Lagrangian contact concept with volume fraction geometry method FSI is performed. The study is done considering two cases (i) Dynamic response of Steel plate in air medium (ii) Dynamic response of steel plate which is submerged in water. The prior case (plate in air) analysis results are compared with the codal response provided in UFC-3-340-02. In the latter case (plate in water) the added mass due to submerged conditions has resulted in increase of the Natural time period of the steel plate. Also, the deformation of the plate for UNDEX case is influenced by the dampening effect from water.