

## Abstract

Success Dam is an earthen embankment dam located east and directly upstream of Porterville, California. The US Army Corps of Engineers owns and operates Success Dam and recently determined that it is at risk of damage and possibly failure under seismic loading. This report conducts a rigid body, decoupled, and coupled Newmark permanent displacement analysis, as well as four empirical methods to approximate the permanent displacement of Success Dam. Approximate methods are a critical step in seismic analysis since more advanced stress deformation modeling is often time consuming and expensive. In a comparison of the results of the permanent displacement rigorous and empirical analyses, the stress deformation analysis performed by the Army Corps produced significantly larger displacements. The discrepancies in the approximate methods are most likely due to the assumptions made for the soil properties and the calculation of the yield coefficient, and from neglecting liquefaction effects.