

The Upper Limitation of Magnitude for Earthquakes Induced by Reservoirs

FUQIONG HUANG

China Earthquake Network Center

The earthquakes in reservoir areas are bound to follow the impounding of reservoir and are generally called as the reservoir induced earthquakes (RIE) or, in brief, the reservoir earthquake. The reservoir earthquake damage causes not only direct economic loss, but possibly the serious secondary disaster such as dam destruction, power cut, etc. . Now more and more super hydraulic power stations are built for more energy. There are more and more high dams and large volume reservoirs built in the East of China and the South-West of China. The reservoir earthquake prediction and damage assessment is significant. The characteristic parameters for reservoir earthquake sequence, such as b value etc. have been studied. The generating conditions and mechanisms of reservoir earthquakes also have been investigated. But the upper limitation of reservoir earthquake magnitude still remained neglect. In this paper we collected 70 reservoirs case data over the world, and statistically analyzed the relationship between volume as well as dam height and reservoir earthquake magnitude. We find that there is an upper limit in this statistic relationship. The upper limit of reservoir earthquake magnitude is linearly related to the reservoir volume multiplying dam height and specific gravity of water. If this relation is widely suitable, we can assess the upper magnitude of reservoir earthquakes during hydraulic power station designing.