

重大工程实践

马尔康巴拉水电站近场区主要断裂活动性及对工程的影响

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摘要:

马尔康巴拉水电站近场区内断层的活动性对工程的设计和坝址的选择极为重要。根据野外调查、ESR测年、断层泥石英形貌、地震活动性等综合分析,认为近场区除松岗断裂以外的其他断层在地表浅部晚更新世以来不具活动性,对工程建设基本不产生影响。松岗断裂中段深部小震频繁,地表未见活动证据,南段错断Ⅱ级阶地,因此中南段属于晚更新世活动断层,北段晚更新世以来不具活动性;日部断裂与松岗断裂中段一样属于深部黏滑浅部闭锁型断层,这种断层可能会在未来地震中产生较大的地表变形,工程建设应避开此类断裂。活动的松岗断裂中南段的潜在地震危险性评估表明,其可能诱发的地震震级约Ms=6.95。拟选的上坝址由于距松岗断裂的安全距离不够,岩石物理条件较差,下坝址的利用落差较小等综合因素考虑,建议选择中坝址更为合理。

关键词: 断裂活动性 石英形貌扫描 ESR测年 地震危险性评估 巴拉水电站

ACTIVITY AND EFFECT OF MAIN FAULTS IN NEAR FIELD OF BALA HYDROPOWER STATION IN MAERKANG

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Abstract:

The activity of a main fault in the near field of Bala hydropower station in Maerkang is very important to engineering design and dam site selection. With the integrative analysis of investigation, ESR dating, quartz shape scanning in the fault gouge and seismic activity, we find that all faults in the near field region of Bala power station except Songgang fault has no perceptible activities in the earth surface since the Late Pleistocene. So they have no side influence to the engineering construction. In the middle section of Songgang fault, small earthquakes occurred frequently in the past several decades. But hardly any evidence can be found to indicate the fault is a active fault. The south section was still active in Late Pleistocene, because the second level river terrace was cut by 0.3m. The north section has been inactive since the Late Pleistocene. The Ribu fault is not active. It has been as same as the middle section of Songgang fault since the Late Pleistocene. But the seismic activity is distinct in the deep part of subsurface. Engineering must keep away from the faults such as Ribu fault and the middle and south sections of Songgang fault. It may induce large surface deformation and fracture. The seismic risk evaluation of the Songgang fault has indicated that the maximal magnitude of earthquake possibly induced by Songgang fault might be Ms=6.95. Considering the factors of inadequate safe distance between Songgang fault and upper site, poor petro-physical properties in upper site and small height of water in lower site, it's better to choose the middle site for the hydropower dam.

Keywords: Active fault Quartz shape scanning ESR dating Seismic risk evaluation Bala hydropower station

收稿日期 2009-12-13 修回日期 2010-05-12 网络版发布日期

DOI:

基金项目:

通讯作者:

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