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论文

西南大渡河某水电站溢洪道陡槽段雾化边坡稳定性分析

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摘要:

泄洪雨雾入渗导致边坡变形进而影响边坡稳定性的问题已成水电建设的重要工程问题之一。针对西南某水电站溢洪道陡槽段边坡挤压错动带发育、节理裂隙和控制性结构面发育等结构特点,分析该边坡开挖支护后泄洪雾化条件下潜在失稳的边界条件及变形破坏模式。根据边坡所处的地质环境条件,从泄洪雾化对边坡岩体的作用机制入手,得到了雨雾对该边坡稳定性的影响主要为雨雾沿着顺倾坡外拉裂面入渗,影响结构面力学特性,从而影响边坡稳定性。并按结构面类型取不同软化系数,采用数值模拟方法分析了泄洪雨雾入渗后边坡的变形破坏趋势。分析结果表明:在考虑不同的软化系数时,溢0+555.00下游侧边坡岩体稳定性有较大的差别,若以中间值0.75考虑,溢洪道陡槽段边坡的稳定性稍差,可能产生一定规模的剪切蠕变或块体失稳,必须加强一定的支护措施保证该处边坡在施工期安全和运营期间的长期稳定性。

关键词: 泄洪雾化, 滑移压致拉裂, 软化系数, 剪切蠕变, 稳定性

**STABILITY ANALYSIS OF ATOMIZED SLOPE BESIDE SPILLWAY AT HYDROPOWER STATION OF DADU RIVER,SOUTHWEST CHINA**

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## **Abstract:**

Spillway slope deformation can be caused by infiltration of rain and fog. It turns to affect the stability of the slope. It has become one of the important problems of the construction of hydropower stations. This paper is based on the structural features of slope slippage belt, cracks and control joints structure developing in atomized slope in the chute segment of the spillway in one south west hydropower station. It analysis the boundary conditions and deformation and failure modes of potential instability in the condition of flood discharge atomization after the excavation and supporting of the slope. It examines the geological environment conditions of the slope. It uses the mechanism of the flood discharge atomization role on the rock slope. It finds that the major impact of rain and fog to slope is infiltration of rain and fog along the tension crack surfaces of the slope. The infiltration influences the mechanical properties of the structural plane, thus affects the stability of the slope. The analysis of the deformation characteristics is carried out on structural plane of the different softening coefficient in the slope. The trend of the slope deformation and failure after the infiltration of flood discharge atomizing rain and fog is further analyzed using numerical simulation. The results show that different softening coefficients can result in a larger difference among the downstream side slope rock mass of the spillway 0+555 00. If the coefficient is the mid value of 0 75, the spillway chute slope is less stable, and probably has a shear creep deformation or block failure. So it is necessary to strengthen certain support measures to ensure the