

锦屏一级水电站深部裂缝控制性灌浆技术研究

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ANALYSIS ON GROUTING TECHNOLOGY FOR CONTROLLING DEEP ROCK CRACKS AT JINPING I HYDROPOWER

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摘要 针对锦屏一级水电站深部裂缝加固技术难题,在对深部裂缝工程地质特征及其灌浆加固技术特点分析基础上,对水泥-水玻璃控制性灌浆技术进行了研究。首先对水泥-水玻璃灌浆作用机理进行分析,然后主要从胶凝时间和强度两方面对水泥-水玻璃浆液进行试验研究,分析了水玻璃和缓凝剂加量对浆液胶凝时间和强度的影响规律,并按初凝时间为5min的情况进行了水泥-水玻璃浆液配比设计。最后,提出采用水泥-水玻璃双液孔口混合式灌浆方法,采用自上而下、孔口封闭、纯压式灌浆方式对深部裂缝进行固结灌浆加固处理。由此初步建立了锦屏一级深部裂缝灌浆加固处理技术研究方案。

关键词: 锦屏一级水电站 深部裂缝 水泥-水玻璃 控制性灌浆

Abstract: This paper analyzes the features of deep rock cracks and grouting technology. It then studies the grouting technology with cement-silicate for controlling the deep rock cracks. It particularly addresses the problems of grouting in deep cracks in Jinping I Hydropower. First of all, the paper analyzes the mechanism of cement-silicate grouting. Then, it investigates the cement-silicate slurry mainly from the aspects of gel time and strength. It studies the influence law of gel time and strength from the dosage of silicate and retarder. It obtains a design formula for 5min.cement-silicate slurry. Finally, the paper proposes the grouting method using two pipe outlets for mixing the two grout fluids. One pipe outlet is for the cement grout and the other for silicate grout. The grouting method further includes the top-down approach, closed hole, and pure pressure grouting, according to the characteristics of the deep rock cracks. Thus, the paper has initially established the research programs of grouting treatment technology for deep rock cracks at Jinping I Hydropower.

Key words: Jinping I Hydropower Deep rock cracks Cement-silicate grout Controlling grouting

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- [1] 国家电力公司成都勘测设计研究院. 雅砻江锦屏一级水电站可行性研究报告.成都:国家电力公司成都勘测设计研究院, 2003.
- [2] Chengdu Hydroelectric Investigation and Design Institute,State Power Corporation of China.Feasibility Study Report on Jinping First Stage Hydropower Station.Chengdu: Chengdu Hydroelectric Investigation and Design Institute,State Power Corporation of China, 2003. 
- [3] 王胜. 锦屏一级水电站左岸抗力体地质缺陷及加固处理技术研究.成都理工大学, 2010.
- [4] Wang Sheng.Analysis on Geological Defects and Reinforcement Techonlogy on Left Bank Resisting Rock of Jinping I Hydropower.Chengdu: Chengdu University of Technology, 2010.
- [5] Wang Shitian,Huang Runqiu,Li Yusheng,et al.A Study on the Key Engineering Geological Problems at Jinping Hydropower Station,Yalong River.Chengdu: Chengdu University of Science and Technology Press, 1998.

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- [6] 祈生文,伍法权,兰恒星.锦屏一级水电站普斯罗沟左岸深部裂缝成因的工程地质分析[J].岩土工程学报,2002,24(5):596~599.
- [7] Qi Shengwen,Wu Faquan,Lan Hengxing.Study on the mechanism of the deep fractures of the left abutment slope at the Jinping First Stage Hydropower Station.Chinese Journal of Geotechnical Engineering,2004,24(5):596~599.
- [8] 黄润秋.中国西部岩石高边坡应力场特征及其卸荷破裂机理[J].工程地质学报,2004,12(增1):7~13.
- [9] Huang Runqiu.Geo-stress distribution and unloading fracturing mechanism of high rock slopes in western part of China.Journal of Engineering Geology,2004,12(supp.I):7~13.
- [10] 谭成轩,张鹏,郑汉淮,等.雅砻江锦屏一级水电站坝址区实测地应力与重大工程地质问题分析[J].工程地质学报,2007,16(2):162~168.
Tan Chengxuan,Zhang Peng,Zheng Hanhuai,et al.An analysis on in-situ crustal stress measurements and major engineering geology issues at the dam site area of Jinping First Stage Hydropower Station.Journal of Engineering Geology,2007,16(2):162~168.
- [11] 顾冲时,伍元,赖道平,等.地质缺陷对坝体结构影响分析模型研究[J].岩土工程学报,2009,13(6):886~891.
Gu Chongshi Wu Yuan,Lai Daoping,et al.Analytical model for the effect of geological defects on dams.Chinese Journal of Geotechnical Engineering,2009,13(6):886~891.
- [12] 蔡元奇,朱以文,李金光,等.地质缺陷对拱坝及坝基力学行为的影响[J].岩石力学与工程学报,2002,21(12):1805~1809.
Cai Yuanqi,Zhu Yiwen,Li Jinguang,et al.Influence of geological flaw on mechanical behaviors of arch dam and dam foundation.Chinese Journal of Rock Mechanics and Engineering,2002,21(12):1805~1809.
- [13] 祝介旺,刘建友,伍法权,等.锦屏一级水电站左岸深部卸荷裂隙的加固方案及数值模拟研究[J].岩石力学与工程学报,2007,26(12):2541~2548. 
Zhu Jiewang,Liu Jianyou,Wu Faquan,et al.Study on reinforcement technology of deep unloaded fissures in left bank of Jinping First Stage Hydropower Station and its numerical simulation.Chinese Journal of Rock Mechanics and Engineering,2007,26(12):2541~2548.
- [14] 孙钊.大坝基岩灌浆[M].北京:中国水利水电出版社,2004.
- [15] Sun Zhao.Rock Dam Grouting.Beijing:China Water Power Press,2004.
- [16] Xiao Enshang,Su Yingchun.Large void formation technique of controlled grouting.Hydraulic Engineering Construction,2009,(S1):50~52.
- [17] 胡国兵.水泥-水玻璃浆液在锦屏工程涌水封堵中的应用[J].人民长江,2009,40(21):32~34.
Hu Guobing.Applications of silicate cement slurry in inflow occlusion in Jinping engineering.Yangtze River,2009,40(21):32~34.
- [18] 李焰,余常茂.三峡坝基灌浆施工主要技术问题及解决措施[J].水利水电科技进展,2007,27(1):31~35. 
Li Yan,Yu Changmao.Main technical problems in dam foundation grouting construction of Three-Gorges Project and measures for their treatment.Advances in Science and Technology of Water Resources,2007,27(1):31~35.
- [1] 朱文彬 伍法权 任爱武.关键块体概率分析在复杂构造条件下大型地下工程开挖中的应用 [J].工程地质学报,2010,18(2):261-.
- [2] 衣晓强 伍法权 熊 峥 .锦屏一级水电站地下厂区破坏成因分析 [J].工程地质学报,2010,18(2):267-.
- [3] 任爱武 伍法权 范永波 熊峥 胡秀宏.复杂地质条件下顶拱大型不稳定块体分析与预测[J].工程地质学报,2008,16(6):788-792.
- [4] 谭成轩,张鹏,郑汉淮,孙伟锋,王继明,孙叶.雅砻江锦屏一级水电站坝址区实测地应力与重大工程地质问题分析[J].工程地质学报,2008,16(2):162-168.