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Analysis of the Movement of Sanzhouxi Landslide in Three-Gorges Reservoir, China

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Since the initial impoundment of the Three Gorges Reservoir in June 2003, a number of new landslides occurred and many dormant landslides were reactivated. Sanzhouxi Landslide located in Wanzhou, the city of Chongqing, 286.9 km west of the Three Gorges Dam and began to deform noticeably after the first impoundment in June 2003. Based on the collection of geological and monitoring data and field investigation, the geological conceptual model was established and the formation mechanism was studied synthetically. Firstly, the intrinsic geological condition, slope structure and material component were analyzed to obtain the geological basis of the landslide formation. Secondly, through the field investigation and analysis of monitoring data, the function of triggering factors, including rainfall and fluctuation of reservoir water level, were discussed. The result indicted that the hydrostatic pressure and buoyancy pressure caused by the rise up of reservoir water level are the main triggering factors for the deformation of landside. Finally, the formation pattern of the landslide was summarized, the formation process is the transition from retrogressive deformation caused by rainfall to the advancing sliding under the action of fluctuation of reservoir water level. The detail formation process is: (1) the top of landslide moved triggered by rainfall, (2) tension cracks occurred in the tongue and middle part of landslide caused by fluctuation of reservoir water level, (3) the tongue and middle part of landslide deformed periodically by the iterative action of rainfall and fluctuation of reservoir water level, (4) the unitive sliding plane formed and the tongue and middle part of landslide moved, (5) the top of landslide slid because of losing bottom supporting.