

Analysis of dam failure and safety assessment and maintenance of the dam with fuzzy logic approach

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Abstract

Around 50,000 large dams are built around the world with a variety of applications. Dam safety has become a growing and critical issue in many countries, as many dams are at risk of failure due to design flaws. These hydraulic structures are considered as a particular type of design, construction, and operation. Statistical data and lessons learned from recent disasters will help to meet the dams' regulations and directives with the main objective of reducing the likelihood of accidents involving large dams. Dam breaking can be a catastrophic event with disastrous consequences for the downstream area and the surrounding area. Explosion and Many potential damages to the dam cause damage to property, the economy, the environment, and possibly death. Most dams built in the first half of the twentieth century suffer from the effects of aging, deterioration and poor engineering standards. The objectives of this study are to use fuzzy method to apply on important parameters such as overflow of natural disaster dam, including flood, heavy rain and earthquake, and investigate the status of the level of stability and safety of the dam. So, in this research, firstly, dam safety information, various types of dam, effective factors in dam failure, dam inspection methods, Damage databases of dam forest types, opinion of experts of dam about connection of input and sustainability parameters and dam security level, method of fuzzy logic system.

Key words: Dams breakdown, dam safety, Concrete dams, Embankment dams, natural disasters, earthquake, and dam overflow, storms.

1. Introduction

Around 50,000 large dams are built around the world with a variety of applications. Water storage damages these hydraulic structures as a particular type of design, construction, and operation. The potential disaster caused by dam destruction can lead to human and financial losses. The failure of several dams in the past has proven the idea and importance of the issue of "dam safety". Our country is Iran with 801 registered dams in the World Dams Database of Stanford University.