

## Abstract

Waterproof earth reservoirs for irrigation are very safe, as shown by the experience and the lack of incidents. Security is an important requirement in the development of modern societies. In this way, the level of security required for earth reservoirs, and in general for any infrastructure is growing.

A reservoir is constructed to satisfy a specific need: the availability of water at the right time in the needed quantity and quality. Any infrastructure may collapse and cause damages on properties, and in the worst of the cases, human deaths. Furthermore, reservoirs are usually at highest locations, which increases the potential damage that may result after breakage. Therefore, the engineers and the agencies involved, may analyze and take steps to avoid repetition of such damages, both material and human.

Although the probability of failure cannot be eliminated absolutely, it's necessary to reduce it as much as possible. This security is clearly associated to the following points:

1. Design criteria and comprehensive control during execution, especially at certain critical points.
2. Once executed safely, maintaining security over time, which requires the existence of a good Operating Standards, and more specifically, effective rules for Maintenance.
3. Despite all, the work may fail , so it's interesting to analyze why , and do it with enough detail so that effective measures can be taken to lessen or even negate the damage, and especially of human life.

The aim of this thesis is to establish recommendations, guidelines and regulations, and lay the foundations for the security management of reservoirs. This new approach has two bases: first, analyze those building elements that provide "*real security*" to the work , and that could be included in the Design and Construction phase , and second: maintaining security in time, establishing methodologies , tools and practical solutions for the Operation, Monitoring, Maintenance and Security Reviews Emergency Plans

It is intended that this document will be useful and serve as a tool for public or private technicians and those responsible for the safety of the reservoirs.

The final purpose of this thesis is to serve as a base for a future specific Safety Standards for reservoirs.