



## Dams' safety is at the very origin of the foundation of ICOLD

In 1928, a number of countries recognized that feedback and experience play a vital part in project design and analysis of dams. The wider the experience base, the greater the benefit that can be drawn from it. They decided to join forces to form a worldwide association, ICOLD.

Taking only the approximately 36 000 large dams listed in the World Register of Dams there have been around 300 reported accidents.

Although the overall failure rate of dams is around 1 %, a time-related analysis shows that this has been reduced by a factor of four or more over the last forty years. This improvement doubtlessly results from the appearance of, and improvements in certain investigation techniques, but it also arises from the wider dissemination of knowledge on risks, and this task in itself justifies the existence of ICOLD and favours the organisation's growth and expansion to every country in the world.



The most important ICOLD publication on accidents, in terms of its information interchange mission, was "Lessons from Dam Incidents (1973)".

Many more works have supplemented the inventory since that time, including ICOLD Bulletin No. 99 "Dam Failures - Statistical Analysis".

It identifies accidents and events by dam type and age and by cause of accident. It increases the designer's awareness of the range of unforeseen factors with, to some extent, their likelihood, and the sequences of events that can lead to disaster.

Designing and building a dam is not a «once-and-for-all» exercise. The structure must be continually supervised and inspected throughout its whole life, to ensure that it remains in good health.

### Most Frequent Causes of Dam Failures:

Overtopping of a dam is often a precursor of dam failure. Overtopping can be due to inadequate spillway design, debris blockage of spillways, or settlement of the dam crest

Foundation defects, including settlement and slope instability, are another cause of dam failures.

«piping», that is internal erosion caused by seepage, is the third main cause. Seepage often occurs around hydraulic structures, such as pipes and spillways; through animal burrows; around roots of woody vegetation; and through cracks in dams, dam appurtenances, and dam foundations.

The other causes of dam failures include structural failure of the materials used in dam construction and inadequate maintenance.