



SAFETY-RE-ASSESSMENT OF EXISTING DAMS

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ABSTRACT

Eurocodes are available for the design of civil works but special construction works (e.g. dams) are intentionally not included. The Eurocodes are aimed not only to achieve more uniform levels of safety but, above all, to the elimination of obstacles to the trade for construction products and engineering services.

But the dam construction activity is much reduced or at all negligible in most of the European countries, where the safety and maintenance of existing dams is the main problem. This is a negative factor for the development of a Eurocode.

Furthermore, for the safety re-assessment of existing dams a “Guideline” could be more appropriate than a “Code”, to take into account the peculiar characteristic and available knowledge of the specific dam under examination.

In many European countries “Guidelines” are already used, in different layouts, to complement superior laws and regulations of mandatory compliance.

Nevertheless, Eurocodes may still be an interesting reference. The semi-probabilistic approach applied in the Eurocodes, that is the use of partial safety factors to face with the various involved uncertainties, seems particularly suitable for the safety re-assessment of an existing dam. A long procedure and many efforts were necessary to bring together different design traditions in the member states and to implement the semi-probabilistic approach in Eurocodes, so it would be very valuable if the result could be used, at least as a general framework, also for dams.

On the other hand, it has been noted that the some partial coefficients defined in Eurocodes may be not appropriate for dams. A further difficulty may derive from the fact that, depending on the specific traditions, experience and culture, in some countries the engineering criteria for dam safety are “associated” also to the potential downstream damage condition, and some safety requirements are graded according to a hazard classification.

In spite of these difficulties, the matter is indisputably of current great interest, and since its formation the ICOLD European Club dedicated careful attention to it.

The “Dam Legislation” Working Group (WG) was one of the first WGs of the ICOLD European Club, and the Club provides in its website the “Dam Legislation” Report that is to be permanently updated by the ICOLD National Committees. Since 2010, at least 8 of the surveyed European Countries updated their dam legislation, in more or less large extent; a fact clearly demonstrating the current efforts and concerns on the subject.

Afterwards, the WG on “Safety of Existing Dams” was activated. It focused its activity on the following main topics: criteria for the classification of dams, procedures to review the safety of existing dams, emergency planning. This WG concluded its work in 2013 and the corresponding Final Report is available at the website of the Club.

Furthermore, an “ad hoc Task Force” has been recently activated, to evaluate the interest and the practical feasibility of a “common technical guideline” devoted to the safety re-assessment of existing dams. In addition to the above-mentioned Reports, the main documents that will provide useful contribution to this discussion include the “Guías Técnicas” prepared by the Spanish National Committee (SPANCOLD) and the “Recommendations” prepared by the French National Committee for the gravity and embankment dams.