

Managing the structural health of concrete dams

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ABSTRACT

Many infrastructures are approaching or exceeding their design life. As a result of economic issues, these civil engineering structures are still in use despite of ageing and the associated damage build up. Dams are not an exception. Nevertheless, safety is one of the priorities of dam engineering, namely due to the high potential risk associated with these engineering works. Many dams, even though showing deterioration signs, are expected to continue in operation significantly beyond the lifetime estimated in the design.

Therefore, the ability to monitor the health of these structures is becoming increasingly important.

Dam safety management is a complex task and requires knowledge on a wide range of subjects and the enrolment of experts from many fields. The activity is supported by a comprehensive collection of data derived from a set of instruments strategically placed throughout the structure in order to monitor the structure health. It is not difficult to guess that data can grow tremendously through the structure lifetime. Moreover, safety standards have been consistently improving and information and communication technologies are themselves still facing great developments and challenges. All these issues call for the development of intelligent tools to efficiently support the management of the dam structural health.

The present work refers to the development of a powerful and innovative IT-based framework to support dam engineers in the complex task of dam safety management - the gestBarragens system. The framework has an open and flexible architecture able to integrate current and future research in the field of structural health monitoring of a large portfolio of dams. Despite the development focus in concrete dams, the developed framework can be easily extended to other type of dam structures.