Reliability principles for spillway gates and bottom outlets

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SYNOPSIS. Reliability analysis of spillway gate installations, and to a lesser extent bottom outlets of reservoirs, has been increasingly used in risk assessments of dams. As a result there is now considerable collected experience of the design and operation of different types of components and systems, both qualitative and quantitative. The qualitative experience has led to general acceptance of some fundamental principles of design and operation in order to achieve good reliability. The paper discusses some of the more important principles, using examples from spillway gates which have been assessed for reliability by the authors. A common approach to attaining reliability is the provision of redundant equipment, yet the occurrence of common cause failures (CCF) – and the need to provide adequate defences against them – is less frequently considered. Attention is drawn to the types of events leading to CCFs and to some potentially effective design defences.

Long-term benefits and performance of dams. Thomas Telford, London, 2004