

Evaluating risk reduction by telematic early warning in dam flood scenarios

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Abstract

The paper presents an assessment to the contribution of a telematic Early Warning System (EWS) for reducing the risk of human fatalities due to dam floods. The telematic system consists of a supervisory control post with wireless connection to an array of remote warning units, and involves automation, data communication, acoustic and power supply equipment. The study combines both the modelling of the societal risk associated to flood scenarios and the analysis of functional safety of the telematic system. Both equipment dependability and human factors need to be taken into account in the safety assessment.

Besides the calculation of societal risks the proposed modelling helps revealing weak points to consider in the design phase, or to care regularly, as well as the relative importance of different actors and resources involved. A case study shows quantitatively the magnitude of the benefits of a hypothetical telematic EWS in a lightly populated dam valley facing a high severity and a medium severity scenarios, for typical human action parameters.

Keywords: dam failure, dam flood warning, early warning system, probability of failure on demand, societal risk reduction.