

## Risk Issues for Controlling Floods through Unsafe, Dual Purpose, Gated Dams

**Authors :** Gregory Michael McMahon

**Abstract :** Risk management for the purposes of minimizing the damages from the operations of dams has met with opposition emerging from organisations and authorities, and their practitioners. It appears that the cause may be a misunderstanding of risk management arising from exchanges that mix deterministic thinking with risk-centric thinking and that do not separate uncertainty from reliability and accuracy from probability. This paper sets out those misunderstandings that arose from dam operations at Wivenhoe in 2011, using a comparison of outcomes that have been based on the methodology and its rules and those that have been operated by applying misunderstandings of the rules. The paper addresses the performance of one risk-centric Flood Manual for Wivenhoe Dam in achieving a risk management outcome. A mixture of engineering, administrative, and legal factors appear to have combined to reduce the outcomes from the risk approach. These are described. The findings are that a risk-centric Manual may need to assist administrations in the conduct of scenario training regimes, in responding to healthy audit reporting, and in the development of decision-support systems. The principal assistance needed from the Manual, however, is to assist engineering and the law to a good understanding of how risks are managed – do not assume that risk management is understood. The wider findings are that the critical profession for decision-making downstream of the meteorologist is not dam engineering or hydrology, or hydraulics; it is risk management. Risk management will provide the minimum flood damage outcome where actual rainfalls match or exceed forecasts of rainfalls, that therefore risk management will provide the best approach for the likely history of flooding in the life of a dam, and provisions made for worst cases may be state of the art in risk management. The principal conclusion is the need for training in both risk management as a discipline and also in the application of risk management rules to particular dam operational scenarios.

**Keywords :** risk management, flood control, dam operations, deterministic thinking

**Conference Title :** ICEMNR 2024 : International Conference on Emergency Management and Natural Risk

**Conference Location :** Melbourne, Australia

**Conference Dates :** February 01-02, 2024