Incorporating Design Life into Flood Risk Assessment – a Guidance for Stationary and Non-Stationary Conditions

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Abstract

Design criteria for flooding infrastructure vary considerably across the globe and within Australia. The adopted standard differs based on extent of flooding, historical practices, political drivers and risk preference. Increasingly, there is a push towards a risk based approach as the basis of selecting an appropriate level of flood protection. This risk based approach is applied to varying levels of rigour by the different agencies involved.

Most current policies and risk assessments focus on stationary risks (stationary likelihood and consequence components). However, it is increasingly recognised that climate change, changes in land-use and development as well as other non-stationary factors have the potential to alter the flooding risks suffered by a project over the course of its operational life. Most policies which seek to address this, generally focusing on climate change, use discrete points in time (such as a climate condition in 2100) rather than considering the effective service life of the structure and the changing risk over the entire effective service life.

As a part of the revision of Australian Rainfall and Runoff, a risk based assessment framework has been identified that incorporates stationary and non-stationary risk. The framework provides both project owners and regulatory approval authorities a method to determine which proposals can adopt pre-set Flood Design Standards; which proposals may require a stationary Risk Assessment; and which proposals may require a non-stationary based Risk Assessment. The proposed framework is based around the establishment of risk profiles by the relevant approval authority / agency (e.g. what combinations of flooding likelihood and consequence are deemed acceptable, tolerable or intolerable), against which a three step process, involving input from both project owners and relevant approval authorities is undertaken to identify an appropriate standard for a project.