



Flood Hazard Analysis of Major Infrastructure with Local Intensive Precipitation

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The Probable Maximum Precipitation(PMP) considering the climate change is computed and compared with the probability flood by frequency analysis to estimate the LIP (Local Intensive Precipitation) to major infrastructures such as NPP. In order to evaluate the external flooding risk on these structures, two dimensional hydraulic analysis is performed and the frequency hazard curve is developed using the results, which include flood depth and intensity by occurrence frequency.

The detailed topographic data for the refinement of the external flooding analysis is constructed and DEM data with high resolutions for sites of the major facilities are generated. Based on the results of the two-dimensional analysis, hazard curves for the inundation depth with frequency and duration are developed at specific area of major facilities. Also the internal flooding within structure, system and components caused by external flood inundation in the major facilities was evaluated.

The causes of external flooding are analyzed by statistical method. A detailed field survey is carried out on the structures, height between the building and the ground, the status of the entrances of the building and windows, and flood protection facilities. In order to evaluate the external flooding safety, a performance function using the relation between external load and resistance is constructed, the safety index of the functions are calculated and then, safety probability is suggested under various risk conditions. For the quantitative vulnerability assessment of external flooding, a hazard curve that considers the external load and the failure probability are presented.

It is expected that the result of study will be a standard for the design of domestic major infrastructure, the improvement of flood prevention measures/procedures, and the evaluation of flood reduction strategies.

Keywords: Local Intensive Precipitation(LIP), Flood Analysis, Flood Hazard Curve

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