Assessing and managing the risks of transition in flood defences infrastructure

Our objective

A transition of the flood defence line at Hurst Spit

"To develop guidance and supporting tools to assess the risks associated with transitions in flood defences and integrate them in to the programme and procedures for risk based flood management in the England and Wales".

What are transitions?

Transitions in flood defences are locations where a change occurs in the defence, whether in terms of internal or external geometry, construction or foundation materials or between flood defence segments.

It is understood from historical floods that most defence failures occur around transitions. This is illustrated by well-known cases such as the levee failures in New Orleans during hurricane Katrina, and by the findings from our reviews of flood defence performance during UK flood events since 2007.

The fact that transitions often form weak points within a defence systems is recognised internationally, and agencies and organisations – particularly within the Netherlands, France and USA – have directed effort to understand how transitions affect overall defence performance and how these impacts should be addressed within an overall risk based approach to their management. Some of this work is reflected in the International Levee Handbook.

What's the scope of this R&D Project?

Current guidance in England and Wales on the visual inspection of flood defence asset does not explicitly account for the potential effects of transitions on defence performance and its

rate of deterioration. Likewise, current risk analysis methods also fail to directly account for the risks arising from transitions. Guidance on the design detail of transition zones is limited to that provided by the International Levee Handbook.

This project aims to address these issues by helping flood risk management authorities to:

- consider the presence of transitions during flood defence condition assessment
- quantify the effects of transitions on flood defence performance and flood risk
- manage the risk of transitions with improved design and retrofit solutions.

The project Team

The Environment Agency has teamed up with a team of international experts to deliver this project. The Team, managed by HR Wallingford, consists of flood risk management, engineering specialists from:

- HR Wallingford
- Royal HaskoningDHV
- Deltares
- IRSTEA
- US Army Corporation of Engineers
- Electricite de France

What will this research produce?

The research will produce 4 principal products:

1. improved guidance for the inspection of transitions zones
2. new methods for the performance assessment of flood defence with transitions
3. new methods to account for transitions in risk analysis of flood defence systems
4. new guidance to support the design, maintenance and repair of transitions

Get involved

There will be opportunity for those interested to get involved through workshops which will be aimed at ensuring the new guidance and methods developed are of practical use for flood risk practitioners.

Find out more

If this work is of interest to you please don't hesitate to contact:

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Find about the Flood & Coastal Erosion Risk Management R&D Programme:
http://evidence.environment-agency.gov.uk/FCERM/en/Default/FCRM.aspx