US Army Corps of Engineers®

Flood&Coastal Storm Damage Reduction R&D Program

Probability of Failure of Gates, Equipment and Warning Systems

Description

Industry reliability data are not adequate to evaluate gate systems, and relevant U.S. Army Corps of Engineers data are inadequate. Therefore, methods are needed to accommodate for deficient data and to account for component condition.

Benefits

Condition is an important consideration within both risk analysis and asset management. Standardized condition assessment methods provide uniform results allowing comparisons over time and across inventory as well as quantified conditions for comparing and prioritizing maintenance and repair (M&R) needs. M&R cannot be prioritized without an understanding of inspected condition.

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https://swwrp.erdc.usace.army.mil/l

Status

Available: Condition assessment for spillway gate systems including operational activities.

Available: Estimating risk from spillway gate systems on dams using condition assessment data.

Planned: Component failure probability estimation based on generic industry data, field failure data, and condition data.

Distribution Source(s)

ERDC-CERL, POC Stuart Foltz

Available Documentation

Chandra S. Putcha and Robert C. Patev. 2000. *Investigation of Risk Assessment Methodology for Dam Gates and Associated Operating Equipment.* ERDC/ITL TR-00-3, Champaign, IL: U.S. Army Construction Engineering Research Laboratory. http://itl.erdc.usace.army.mil/pdf/tritl003.pdf

Foltz, Stuart, Kevin Rens, Dean Yoshimura, Jose Rodriguez, James Stecker, and Robert Todd. 2003. *A Survey of Early Warning Systems Within the U.S. Army Corps of Engineers and U.S. Bureau of Reclamation.* ERDC/CERL TR-03-21, Champaign, IL: U.S. Army Construction Engineering Research Laboratory.

Patev, Robert C., Chandra Putcha, and Stuart D. Foltz. 2005. *Methodology for Risk Analysis of Dam Gates and Associated Operating Equipment Using Fault-Tree Analysis*. ERDC TR-05-3. Champaign, IL: U.S. Army Construction Engineering Research Laboratory. http://owww.cecer.army.mil/techreports/Foltz_risktree/Foltz_risktree.pdf

Estes, A., S. Foltz, D. McKay. *Estimating Risk from Spillway Gate Systems on Dams Using Condition Assessment Data. 2005.* ERDC/CERL TR-05-40. Champaign, IL: U.S. Army Construction Engineering Research Laboratory. http://libweb.wes.army.mil/uhtbin/hyperion/CERL-TR-05-40.pdf

Chouinard, Luc, E., Stuart Foltz, Jean-Guy Robichaud, and Ralph Wittebolle. 2007. *Condition Assessment Methodology for Spillways*. Champaign, IL: U.S. Army Construction Engineering Research Laboratory.

Foltz, Stuart and Luc E. Chouinard. 2007. *Condition Indexing of the Wolf Creek Dam Spillway and Embankment, Kentucky*. Champaign, IL: U.S. Army Construction Engineering Research Laboratory.

Journal and conference papers also available.

Available Training

Spillway System Condition Assessment Methodology: Based on evaluation of a project or projects as needed by the District. Cost based on travel and labor for an instructor/facilitator to the District.

Available Support

Provided by ERDC-CERL, POC Stuart Foltz

Application

Examples in methodology report and Wolf Creek demonstration report.

Point of Contact

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Partners

U.S. Bureau of Reclamation, Hydro Quebec, Manitoba Hydro, Ontario Hydro.