

EXTERNAL FLOODING

Computer Based Training Module Available on NANTeL



ABSTRACT

This CBT is a self-paced, detailed, comprehensive, nuclear industry generic overview of the overall purpose, terminology and objectives of External Flooding. The training defines key flooding terminology (PMP, LIP), identifies how the information is used in flooding analysis, and discusses the impacts of drains and dams and how to evaluate protective and other hazards associated with flooding. The module has undergone one round of revision to address ownership issues and feedback via NANTeL and other sources to make it more effective and seamless for the learners. The final exam was revised to add the open book resource documents link and reformat selected questions to improve clarity based on exam analysis and feedback.



INTENDED AUDIENCE

1. Experienced nuclear plant mechanical and civil engineers who are developing expertise in External Flooding
2. Site engineering Managers or Supervisors



DURATION

- 1.5 hours
- An additional 8-12 hours for reading materials provided within the CBT

TERMINAL LEARNING OBJECTIVES

1. Explain the flooding process.
2. Identify factors affecting flooding analysis.
3. Describe the different methods of calculating flood impact.
4. Describe other characteristics that impact flooding analysis for nuclear sites.

KEY INDUSTRY DOCUMENTS

1. NUREG CR-7046, Design Basis Flood Estimation for US Nuclear Power Plants
2. NRC Regulatory Guide 1.102, Flood Protection for Nuclear Power Plants
3. NRC Regulatory Guide 1.59, Design Basis Floods for Nuclear Power Plants
4. NEI 12-06 [Rev.0], Diverse and Flexible Coping Strategies (FLEX) Implementation Guide
5. ANSI/ANS 2.8-1992, Determining Design Basis Flooding at Power Reactor Sites

Suggested Additional Reading:

1. ANSI N170-1976, Standards for Determining Design Basis Flooding at Power Reactor Sites [superseded by ANSI/ANS 2.8-1992]
2. U.S. Army Corps of Engineers, Report No. CPD-74B, Hydrologic Engineering Center, Hydrologic Modelling System HEC-HMS, Technical Reference Manual, March 2000
3. U.S. Army Corps of Engineers, Report No. CPD-69, Hydrologic Engineering Center, HECRAS River Analysis System, Hydraulic Reference Manual, Version 5.0, February 2016
4. USGS Water-Supply Paper 2339, "Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains," US Department of the Interior 1989
5. NRC, "Guidance for Assessment of Flooding Hazards Due to Dam Failure", JLD-ISG-2013-01, June 2013