



## **Flood Consequence Estimation with HEC-LifeSim (full-day)**

*Eligible for 0.8 CEUs or 8 PDHs*

Several Federal agencies and dam / levee owners have made significant efforts over the last decade to understand and quantify the risk of their dam and levee portfolios. The dam and levee safety community is relatively familiar with potential failure mode analysis and estimating failure likelihoods, but there is less familiarity with estimating the consequences of failure.

Risk is estimated through the combination of the probability of an event, the performance of the structure, and the consequences of failure. Quantifying consequences can be done in varying levels of detail and there are several tools available to perform these estimates. USSD is proposing a series of workshops for the dam engineering community to gain familiarity in using these tools. The focus of the first in this series is the US Army Corps' model, HEC-LifeSim, which provides a detailed look at flood impacts and evacuation. Future workshops may cover: RCEM (US Bureau of Reclamation), the Life Safety Model (HR Wallingford), and the "Dutch method" (Dr. Bas Jonkman).

The 8-hour, hands-on workshop is designed for dam and levee owners and regulators, hydraulic engineers, consequence modelers, and young professionals to get familiar with the software and its uses. The workshop includes the following topics:

- Risk Assessment Process Overview
- How to Quantify Consequences
- Building a HEC-LifeSim Model (Structures, Floodplains, Warning and Evacuation)
- Application of the Model Results
- Review of a Historic Flood



## Introducing ICOLD Bulletin 177 on Roller Compacted Concrete (morning)

*Eligible for 0.4 CEUs or 4 PDHs*

The USSD Committee on Concrete Dams is organizing a workshop to introduce a new ICOLD Bulletin on Roller-Compacted Concrete finalized in 2018. The purpose of this Bulletin is to present the current state-of-the-art practice on roller-compacted concrete (RCC) for dams. During the workshop, primary authors of the Bulletin chapters will be giving presentations on design and construction of RCC dams.

The 2018 Bulletin addresses all aspects of the planning, design, construction and performance of RCC in dams, with specific topics related to mix proportioning and quality control. Many aspects of RCC dam construction have become better understood since the 2003 publication of Bulletin 126. The new Bulletin contains more comprehensive information particularly in relation to design, mixture proportioning, and construction. With a greater understanding of the requirements of successful RCC dams, as well as the pitfalls and difficulties associated with RCC dam design and construction, an effective discussion can be utilized.

### **Workshop Organizing Committee:**

Dr. Jerzy Salamon  
Mr. Mike Rogers  
Dr. Quentin Shaw

Bureau of Reclamation  
Stantec  
ARQ

### **Agenda:**

- 8:00 AM**     **Welcome** - Jerzy Salamon – USSD Committee on Concrete Dams Chair  
Purpose of the Bulletin - Quentin Shaw – Bulletin 177 Subcommittee Chair  
Background and Design of RCC Dams - Quentin Shaw  
Key New Developments of the RCC Technology - Quentin Shaw  
RCC Mix Design -Tim Dolen (Dolen and Associates)  
Construction of RCC Dams - Rafael Ibanez de Aldecoa (Dragados)
- 9:50 AM**     **Break**  
Quality Control -Tim Dolen  
Performance of RCC Dams -Tim Dolen  
Other Applications of RCC - Mike Rogers  
Summary - Quentin Shaw  
Application of the Bulletin to the US Practice - Kenneth Hansen (Consultant)  
Workshop Closeout - Jerzy Salamon



## **Threshold and Action Levels Workshop**

**(morning)**

*Eligible for 0.4 CEUs or 4 PDHs*

### **Workshop Description**

When used effectively, threshold and actions levels can help dam owners and engineers identify instrument readings outside the expected range and trigger action when needed. Potential action includes reading verification, engineer evaluation, formal investigation and implementation of risk reduction measures. Threshold and action levels should be customized for each dam based on owner needs, potential failure modes of the dam and available instrumentation. Because the use of threshold and action levels varies greatly between different dams and owners, there is some confusion about how these tools should be developed and used as part of a dam safety program. To help workshop participants understand the various uses of threshold and action levels, this workshop will include presentations, case studies and panel discussion from four federal agencies, dam owners and consulting engineers.

### **Workshop Objective**

Workshop attendees will learn how threshold and action levels can be an effective safety tool for dams of varying type, size and complexity.

### **Primary Audience**

Dam owners, consultants, and regulators

### **Agenda**

#### **Introduction (8-8:30)**

- Overview of how monitoring is an integral part of a dam safety program
- Introduction of threshold and action levels as a dam safety tool
- Review of key terms
- Consideration of instrument accuracy and precision

#### **How to develop threshold and action levels (8:30-10:00)**

- Approaches
  - Design basis
  - Historic range
  - Expected performance



- How to use as a tool for dam safety
  - Construction vs. Long-term performance monitoring
  - Monitoring Potential Failure Modes (PFMs)
  - Identifying unexpected performance (general health monitoring)
- Advanced concepts
  - Automated monitoring and alarms
  - Varying thresholds based on pool level, activity of other sensors, time, rate of change
- Agency approaches
  - USACE
  - USBR
  - FERC
  - TVA

Break (10:00-10:30)

Case Studies: Successful application of threshold and action levels (10:30-11:30)

- Case studies presented will be diverse with regard to:
  - Federal agency, private owner and consultant
  - Type and size of dam
  - Type of monitoring system
  - Approach to developing threshold and action levels
  - One case study will highlight a state of the art monitoring system that triggers alarms when threshold and action levels are exceeded

Panel Discussion/Wrap-up (11:30-12:00)

- Participants will be able to submit questions throughout the workshop and during the panel discussion



## Seismic Evaluation of Concrete Dams (afternoon)

*Eligible for 0.4 CEUs or 4 PDHs*

Seismic analyses of concrete dams are becoming more dependent on advanced modeling techniques as the needs of the industry advance. The relative scarcity of data related to the performance of dams subjected to extreme seismic events limits verification of analytical tools and analysis results. Recognizing this constraint, solicitation of opinions among researchers and practitioners about the current state-of-practice in seismic analysis of concrete dams is warranted. It is essential to verify the consistency of the analysis results for the considered potential failure modes.

The primary objectives of the workshop are:

1. Review, summarize and interpret past USSD workshop outcomes.
2. Evaluate accuracy of analysis methods used in the seismic analysis of concrete dams.
3. Identify research priorities for both public safety and the needs of dam owners.
4. Solicitation of opinions among researchers and practitioners about the current state-of-practice in seismic analysis of concrete dams regarding whether analysis results are consistent with observed performance and whether the right potential failure modes are being addressed.

The USSD Committee on Concrete Dams and the Earthquake Committee organized a workshop during the 2018 USSD Conference in Miami on the *Evaluation of Numerical Models and Input Parameters in the Analysis of Concrete Dams*. The workshop was attended by dozens of professionals representing the engineering industry and academia, dam owners, and the dam safety community. The 2019 session is a continuation of the previous workshops held every year since 2016 on the aspects related to the structural analysis of concrete dams.

### Workshop Organizing Committee:

Dr. Jerzy Salamon	Bureau of Reclamation
Dr. Lelio Mejia	Geosyntec Consultants
Mrs. Hillery Venturini	Bureau of Reclamation

### Agenda:

#### 1:00 PM Welcome

Presentation of 2018 Workshop Results and Conclusions (Hillery Venturini & Jerzy Salamon) (40 min)

Accuracy in the Advanced Analysis of Concrete Dams- Professor Boris Jeremic, CEED, University of California, Davis, and Faculty Scientist, EESA, Lawrence Berkeley National Laboratory, Berkeley, CA (60 min)

#### 2:45 PM Break

#### 3:00 PM Discussion

Lessons Learned from the Past USSD Workshops (30 min)

Developing Best Practice in Seismic Analysis of Concrete Dams (30 min) Open discussion (55 min)

Conclusions (5 min)

#### 5:00 PM Adjourn



## **Emergency Communication Primer (afternoon)**

*Eligible for 0.5 CEUs or 5 PDHs*

Communication during and immediately preceding an emergency is a critical step of response and recovery necessary to protect public safety and minimize damages. In these scenarios, key technical information must be communicated quickly, clearly, and concisely to varied, non-technical audiences with differing concerns and perspectives. Direct communication from dam owners and their agents is the best way to properly inform and reassure these affected parties, which include emergency responders, government officials, construction workers, and the general public.

This workshop aims to refine communication skills through presentations, a real-life case study with experienced emergency responders, discussions, and a group activity. Participants will learn and rehearse best practices for communication of critical, precise information under emergency conditions to facilitate public safety, risk reduction, and damage mitigation. This workshop offers an opportunity for participants to practice seemingly obvious skills in a controlled environment to be better prepared should the unthinkable happen, when judgment can be hampered by stress, urgency, and fatigue.

Workshop objectives include:

- Parsing technical information for non-technical stakeholders (e.g. emergency responders, government officials, construction workers, the public, etc.)
- Succinct messaging in high-stress, time-sensitive situations
- Understanding and avoiding mass panic
- Upsides and downsides of social media
- Lessons learned from past emergencies

By attending this workshop, the attendees will learn strategies for efficient, audience-oriented communication in emergency scenarios.