Collaborative Technical Assistance in Meeting Senate Bill 92 Requirements

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Present to:
2019 FMA Annual Conference
San Diego, California
Introduction

• After Oroville Dam spillway failure in Feb. 2017, Senate Bill SB 92 was passed in June 2017 requiring owners of State-regulated dams to prepare dam failure inundation maps and Emergency Action Plans (EAPs) by Dec. 2018

• Ventura County 2018 Grand Jury Report
Introduction

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Ventura County 2018 Grand Jury Report
The Collaborative Technical Assistance Approach

- FEMA
- State – Cal OES
- DWR / DSOD
- Locals
The Collaborative Technical Assistance Program

- A one-year program started in June 2018
- A collaboration between FEMA, CA DWR, CAL OES, and Ventura County dam owners
- Allowed access to technical assistance from federal and state agencies
- Allowed access to Decision Support System-Water Infrastructural Security Web (DSS-WISE)
- On-site training on planning for dam emergencies
The Collaborative Technical Assistance Program

DSS-WISE™ Web
Decision Support System for Water Infrastructural Security Web

- Secure, web-based graphical user interface and map server providing analytical capabilities and a decision support system for dam/levee security.
- Free-of-charge system available 24/7 to FEMA, state dam safety offices, and stakeholder federal and state agencies.
- Simplified data entry in 12 easy steps with real-time validation of user input. User input is kept to a strict minimum.
- Automated input data preparation using national databases (USGS, NED DEM, levees, bridges, classified land use/cover).
- Upwind, shock-capturing scheme handles wetting/drying and allows for mixed regime flows (subcritical, transcritical, and supercritical).
- Provides automated, two-dimensional flood modeling/mapping capabilities with cell sizes from 20 ft. to 200 ft.
- Displays inundation extent periodically during the simulation. In 80% of the cases, results are available in less than one hour.
- The final results package includes a PDF report, raster files (Hazard MH compatible), shapefiles, and a KMZ file of the inundation extent.

Designed and Maintained by
The National Center for Computational Hydroscience and Engineering
The University of Mississippi

Operated for
U.S. Department of Homeland Security
Federal Emergency Management Agency

Useful Links
ASDSS
USSD
ASIPM
Dam Inundation Mapping

- **Scope of Work**
  - Step 1: Data Collection
  - Step 2: Technical Approach
  - Step 3: Hydraulics Analysis
  - Step 4: QA/QC
  - Step 5: Mapping and Reports
Dam Inundation Mapping

- Step 1 - Data Collection
Dam Inundation Mapping

Step 2 - Technical Approach: 1D, 2D and 3D Model?
Dam Inundation Mapping

Step 3 - Hydraulics Analysis

• Hypothetical Scenario
• Sunny Day Failure
• HEC-RAS
• DSS-WISE
• Piping Failure
• Key Parameters
• Sensitivity
• Worst Case Scenario

BREACH DIAGRAM
Dam Inundation Mapping

- **HEC-RAS 2D**
  - Army Corps of Engineer
  - 2D Model
  - Grid Cell
  - Processing Time
  - Piping Elevation
  - Breach Parameters
  - Manning’s N
  - Computational Timestep
Dam Inundation Mapping

Step 4: QA/QC

HEC-RAS 2D

DSS-WISE
Step 5 - Mapping and Reports

- DEPTH, VELOCITY, AND ARRIVAL TIME
- CRITICAL INFRASTRUCTURE
- WHO IS THE END USER?
Emergency Action Plan

Federal Guidelines for Dam Safety
Emergency Action Planning for Dams
FEMA 64 / July 2013

2018

Cal OES
GOVERNOR’S OFFICE OF EMERGENCY SERVICES

Stewart Canyon Debris Basin DSOD No. 86.009
Emergency Action Plan

- New EAP Details
## Emergency Action Plan

<table>
<thead>
<tr>
<th>Condition</th>
<th>Potential Failure</th>
<th>Imminent Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spillway flow - Dam Failure</td>
<td>Water within 3’ of spillway crest. Water above elevation 920’&lt;br&gt;Continuous monitoring of water elevation required</td>
<td>Spillway flow occurring, water above elevation 923’&lt;br&gt;Erosion of the dam adjacent to the spillway is expected and could erode the dam&lt;br&gt;Complete dam failure could occur within 24 hours</td>
</tr>
</tbody>
</table>
If a potential failure mode is identified, Who you gonna call?

Note: If the water level in the reservoir reaches 3ft from the top of the spillway, the Dam Safety Officer will notify the VC OES to activate the notification phase.

Figure 2. Potential Failure Notification Plan (Revised Nov. 2018)
Dam failure is imminent or occurring,

Who is the Sheriff gonna call?

Figure 3. OES Notification Plan (Revised Dec. 2018)
The Collaborative Technical Assistance Program

- Two on-site TA workshops on planning for dam emergencies were conducted in June and July, 2019
- About 30 local dam emergency management personals participated in the training and exercise.
- Focused on communication aspect of dam emergencies
- Workshops utilized interactive exercises to teach emergency communication principals.
Conclusions

- Technical Collaboration Works!
  - Contributed to quality mapping effort
  - Improved quality of EAPs
  - Better communication with other County and local agencies
- Enhanced the readiness of Ventura County communities to respond to dam emergencies
- Collaboration continues with FEMA, DWR, and CALOES to finalize the maps EAPs
- Big thanks to FEMA, DWR, and CALOES for their support and collaboration!
Questions?