USSD 2018 Third Workshop on Case Histories in Dam Safety Risk-Informed Decision Making

Welcome

David S Bowles, Chair, CODS Risk Subcommittee
WORKSHOP ON CASE HISTORIES IN RIDM

- Sponsored by the USSD Committee on Dam Safety and Dam Security
  - chaired by Brian Becker
- Through its Risk Subcommittee
  - chaired by David Bowles
- Workshop Organizing Group:
  - David Bowles, RAC Engineers and Economists, LLC and Utah State University (Chair)
  - Nate Snorteland, US Army Corps of Engineers
  - Douglas D. Boyer, FERC
  - Brian Becker, Reclamation
PURPOSE

- To present risk assessment case histories that illustrate
  - how actual applications have been conducted and
  - how their results have been used in decision making.
- To make the concepts and theory of risk assessment more understandable to dam safety practitioners.
REQUESTED PRESENTATION OUTLINE:

1. Purpose, Context and Scope

2. Baseline Risk Assessment

3. Risk Reduction Assessment (if applicable)

4. Limitations, Decisions, Risk Communication and Lessons Learned
1 PURPOSE, CONTEXT AND SCOPE

1.1 Purpose of the risk assessment - what lead up to it being requested?

1.2 Context for the risk assessment - owner's dam safety program, regulatory role, dam safety standards, tolerable risk guidelines, legal considerations, owner's business considerations, other stakeholders, etc.

1.3 Scope of the risk assessment - types of outcomes desired, range of load/initiating event types, range of failure modes, types of consequences, desired level of confidence, how uncertainty was addressed
2 **Baseline Risk Assessment**

2.1 Potential failure modes identification
2.2 Evaluation against dam safety standards
2.3 Risk model form - system identification, event trees, fault trees, uncertainty, etc.
2.4 Estimation of load/initiating event probabilities
2.5 Estimation of system response probabilities and other engineering performance relationships
2.6 Estimation of consequences including exposure case of life-loss estimates
2.7 Risk estimates and their evaluation against tolerable risk guidelines for the existing dam
2.8 Insights and recommendations
3  **RISK REDUCTION ASSESSMENT**

3.1 Identification of risk reduction alternatives

3.2 Representation of risk reduction alternatives in the risk model

3.3 Risk estimates and their evaluation against tolerable risk guidelines for the risk reduction alternatives
4 LIMITATIONS, DECISIONS, RISK COMMUNICATION AND LESSONS LEARNED

4.1 Limitations

4.2 Decision and risk management recommendations, including
  - their basis in the risk assessment outcomes
  - how they affected the actual decision
  - how uncertainty was considered in the decision process
  - value added by using risk assessment

4.3 Risk communication

4.4 Lessons learned
8 Case Histories - Diversity

- Purposes
  - Design
  - Construction risk
  - Existing
  - Portfolio Management

- Approaches/levels of detail
  - Uncertainties
  - Limitations

- Owner: Federal, State, Private
- Regulated, Self-regulated and Regulator
- Location: Throughout US, Australia
- Types of Dam
- Levels of Risk Assessment: PFMA, SQRA, Range of QRA
- Failure Modes
- Risk Reduction Measures
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Introduction</td>
<td>David Bowles, Chair, Risk Subcommittee, CODSS</td>
</tr>
<tr>
<td>8:05</td>
<td>Welcome</td>
<td>Brian Becker, Chair CODSS</td>
</tr>
<tr>
<td>8:10</td>
<td>Session 1</td>
<td>Douglas Boyer, FERC</td>
</tr>
<tr>
<td>8:10</td>
<td>Case History 1</td>
<td>Detailed PFMA for the Design of New Glades Reservoir. Jennifer Williams, AECOM</td>
</tr>
<tr>
<td>9:00</td>
<td>Case History 2</td>
<td>Tellico Dam Semi-Quantitative Risk Analysis. Husein Hasan and Caleb Douglas, TVA</td>
</tr>
<tr>
<td>9:50</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:05</td>
<td>Case History 3</td>
<td>Preliminary Quantitative Risk Assessment and FERC Pilot Study for Alcona Dam. David S. Bowles, RAC Engineers and Economists &amp; Utah State University</td>
</tr>
<tr>
<td>10:55</td>
<td>Case History 4</td>
<td>Construction Risks at Stampede Dam. Jennifer Huggins, Bureau of Reclamation</td>
</tr>
<tr>
<td>11:45</td>
<td>General Discussion</td>
<td>Moderator: Douglas Boyer, FERC</td>
</tr>
<tr>
<td>12:15</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>13:15</td>
<td>Session 2</td>
<td>Moderator: Nate Snorteland, USACE</td>
</tr>
<tr>
<td>14:05</td>
<td>Case History 6</td>
<td>Seqwater Dams Portfolio Risk Assessment. Barton Maher, Seqwater</td>
</tr>
<tr>
<td>14:55</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>15:10</td>
<td>Case History 7</td>
<td>A Scaled and Efficient Semi-Quantitative Risk Analysis for a Portfolio of 22 High Hazard Dams. Daniel Osmun, HDR</td>
</tr>
<tr>
<td>16:00</td>
<td>Case History 8</td>
<td>Victoria’s dam safety – the risk management journey: A Risk-informed Regulatory Approach. Siraj Perera, Department of Environment, State of Victoria (presented by David Bowles, RAC Engineers and Economists &amp; Utah State University)</td>
</tr>
<tr>
<td>16:50</td>
<td>General Discussion</td>
<td>Moderator: Nate Snorteland, USACE</td>
</tr>
<tr>
<td>17:25</td>
<td>Wrap-up comments</td>
<td>David Bowles, Chair Risk Subcommittee, CODSS</td>
</tr>
<tr>
<td>17:30</td>
<td>Dismiss</td>
<td></td>
</tr>
</tbody>
</table>