

Small Group Exercise



Goal

Try your hand at assessing the risk (loss of life and economic) of a hypothetical dam.



The dam is a hypothetical example with bits and pieces drawn from many dams which may or, may not, have had real incidents or failures.



To Do

- Develop a list of Potential Failure Modes
- Choose one or two PFMs to fully develop for use in the risk assessment
- If you feel that information is missing to fully develop your failure mode, make assumption and include a discussion of the assumption in the “Making the Case” document along with suggested studies that to develop the information.



To Do

- “Make the Case” for the risk associated with your fully developed failure mode.



Making the Case

- Explain the logic for the failure mode.
- Address how you came up with the probabilities of the loading condition (full range, i.e. a flood frequency curve, PSHA, the probability of spillway blockage given different floods, etc.) and the range of uncertainty associated with the loading.



Making the Case

- Address how you came up with the probability for failure of the dam given the loading conditions, again the full range of loading conditions, and the associated uncertainty.
- Address how you came up with the potential consequences, both life loss and economic, and the associated uncertainties.
- Make a recommendation as to what actions, if any, are recommended.



The Dam Safety Case is a logical set of arguments used to advocate a position that either additional safety-related action is justified, or that no additional safety related action is justified.



The arguments string together key evidence regarding the three basic risk components, (i.e. load probability, response probability, and consequences) so as to convince decision-makers that the dam's existing condition and ability to withstand future loading, the risk estimates, and the recommended actions are all coherent.



Since uncertainty is inherent in each claim, the arguments should also address whether confidence is high enough to stand on the basis of existing evidence.



The safety case and the identification of risk management options are recognized as essential elements in Reclamation's project-ranking efforts to ensure public protection. They represent understanding of existing condition and predicted future behavior stated as objectively as possible. The safety case should not be used as a means of back-fitting an argument for design decisions or business decisions that have already been made.



The risk estimates and the dam safety case do not in themselves ensure the safety of a facility. The dam safety case becomes the basis for risk management in the effect it has on the activities and behaviors of the people who interact with the facility.



The understanding given to all, from facility operators to caretaker engineers to dam safety program managers to Reclamation directors, by a well constructed dam safety case is intended to focus attention on behavioral and technical aspects essential to the facility's integrity so that the facility can be operated and maintained in a safe manner.



The dam safety case should be carefully crafted so that all descriptions and terms are easy to understand by the prime audience, all arguments are cogent and coherently developed, all references are easily accessible, and all conclusions are fully supported and follow logically from the arguments.



If You're Stuck

Ask one of us.

