Objective of Atlanta RIDM Levels 1 and 3 Workshops

A stated objective of the FERC's FY14 – 18 Strategic Plan is to use risk-informed decision making (RIDM) for dam safety. The current standards based program has been very successful at preventing dam failures and improving dam safety over the last 30 years. Some of the successful aspects of the program include:

- Determination of general hazard categories, high, significant, and low
- Focus of dam safety activities on high and significant hazard dams
- Evaluation of dam safety for defined loading including usual, unusual, and extreme loading conditions.
- Rehabilitation of dams to meet these defined loading conditions.
- Review of dam safety by Independent Consultants and Boards of Consultants as needed.
- Surveillance and monitoring of dams.
- Emergency Action Planning

The RIDM program is being developed to improve dam safety at FERC regulated dams.

We note that many recent dam failures were not prevented by the standards based program. Swift No. 2 Dam failed by internal erosion through a lava tube under the embankment. Many warning signs were missed.

Taum Sauk Dam failed by overtopping from overpumping. The standards based approach failed to understand the likelihood or probability of a dam failure.

In addition, the risks of many potential dam safety issues are not well understood because the risks have not been adequately evaluated or documented. The Wanapum Dam on the Columbia River developed a crack in a spillway section that has caused major economic and cultural impacts to the project. These types of consequences are often not fully understood when evaluating issues under current practices.

Standards based dam safety evaluations typically ensure that the dam adequately meets appropriate criteria, but this leads to a check-the-box mentality. This type of thinking can cause engineers to stop thoroughly evaluating dam issues. Thorough evaluation and open-minded thinking is what discovers problems that could lead to a dam failure.

While it is not clear that every dam failure would have been prevented by utilizing RIDM procedures, these techniques improve the chances of discovering these potential failures. Risk informed procedures help reduce risk by improving thinking. Potential failure mode analyses (PFMA) start with thinking creatively about how the dam can fail. Development of PFM event trees and probabilities requires further detailed thinking about how critical PFMs can develop and be prevented.

This process not only reduces risk but better documents dam safety decisions made with engineering judgment. Without risk informed procedures, many of the assumptions used in engineering judgment cannot be adequately reexamined because they lack sufficient documentation, documentation that is developed by RIDM procedures.

Level 1 Workshop

The Division of Dam Safety and Inspections (D2SI) has developed RIDM engineering guidelines to advise dam safety engineers on how to complete risk analyses. For those new to risk, the RIDM Level 1 workshop provides conceptual information about these risk analysis procedures. Attendees should leave with a basic understanding of risk concepts and how risk procedures can improve their understanding of dams they are responsible for.

Level 3 Workshop

The Level 3 Workshop is for those that have previously attended earlier Level 1 and 2 workshops. In Level 3, they will participate in a simplified risk analysis. RIDM

concepts will be learned while participating in a small group setting. Level 3 will provide training in probability theory and practice. Attendees will self-identify by engineering specialties and use previously provided materials to complete the following tasks:

- Develop a particular PFM and event tree related to their specialty.
- Develop probabilities for each node of the event tree.
- Develop consequence information for this PFM.
- Plot the PFM probability and consequence data on an fN chart
- Develop a Making the Case report
- Present this case to the workshop participants.

Attendees should leave the workshop with knowledge of how to complete the tasks above, and an enriched understanding of how risk-informed procedures can be used to improve dam safety.