Risk Management for Dam Rehabilitation Projects

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Rehabilitation of existing dams involves a range of design, construction, and operation risks, some of which are not encountered in new dam construction. These risks can have significant impact on project schedule and project budget. It is of critical importance that Owners, Engineers, and Contractors understand and communicate these risks during the design and construction phases. Existing dams typically were designed in an era of design and construction standards that have been upgraded and modified. Modern standards will impact the design and construction approaches utilized and require understanding the impacts that differ from the original standards. Knowledge of both sets of standards is invaluable for selecting and designing rehabilitation components. Construction records and as-built drawings generally are completed at the end of construction, if at all. These records, for many projects do not accurately reflect the conditions within the dam and appurtenant works of the existing facility. It is typical to “expect surprises” both during investigation of the existing facility to obtain information for use in design, as well as during construction. These “surprises” should be expected even though the situation is not well understood. The existing dam is likely an important water supply component that is in operation. Loss of use of the reservoir during investigations for design and, specifically, during construction may be an impact that is not fully realized. This can cause complications impacting the overall cost and schedule of a project. The unknowns, be they known unknowns or unknown unknowns, can be anticipated by developing an approach through the design and construction process that may not recognized the appropriate issue/problem, but at least alert the designer and contractor of potential issues. A Risk-Based approach applied for the entire life of the rehabilitation project can be used to alert all parties of potential “surprises” and provide direction to all parties for mitigating issues as they arise. This type of approach is particularly effective when the process includes senior practitioners with decades of design and construction experience in all aspects of dams. Minimizing impacts created by “surprises” particularly during construction, can result in a successful project meeting budget and schedule goals and modern design standards. This paper provides a framework and case histories where such processes were utilized.