Quality Assurance/Quality Control in Dam Safety Design - An Essential Component of the Design Process

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Quality Assurance and Quality Control (QA/QC) are terms commonly associated with construction and not design. Terms like “checked by” or “peer reviewed by” are more common in the design process, although the concepts are essentially the same. A complete quality control program is an essential element of the design process. The dam safety industry may take for granted that a quality QA/QC program is completed during the design process, including the development of drawings and specifications. Unfortunately, there is increasing evidence that we may not be paying as much attention to this as we should be. There are many factors that could contribute to this apparent decrease in QA/QC ranging from tighter budgets and schedules, the loss of experienced designers, excessive dependence upon high-tech software programs, and other factors not fully realized during the design process. One of the first activities after a dam safety incident is a focused review of the design of the dam or feature that failed. Contributing factors to an incident does not necessarily include a major design flaw. Typically there are several factors, but a contributing factor to a recent major dam safety incident included something as simple as a math error. Other contributing factors are quite varied and could include such things as attempting to fix an old structure that does not meet current design standards and violating the mantra of “do no harm” by placing a band aid where a major modification is required. Budget is not typically discussed openly but is often the single largest factor that influences the selection of the designer. With increasing costs impacting every aspect of our profession, it should be realized that good QA/QC is something that should not be minimized. A rigorous design review program also provides a great training and mentoring opportunity for younger engineers to gain the experience necessary to maintain our industry. A design review should include digging deeply into the design calculations, reviewing drawings, specifications, computer program input parameters and output results, and working with senior staff to learn how to apply good engineering judgment to dam design. This can often be much more effective and less expensive than sending the staff to more formal training. This paper is intended to bring a renewed focus to the importance of a good QA/QC program during the design of new dams or the modification/rehabilitation of existing dams, as well as design changes required during construction.