HARVEY MUDD COLLEGE

Engineering Seminar Program
Wednesday, October 14, 2009
Galileo McAlister
4:15 p.m.

Gregg A. Scott, P.E., Civil Engineer, SeniorTechnical Specialist Bureau of Reclamation

Gregg Scott received B.S. and M.S. degrees in Civil Engineering from the University of Colorado, Boulder, and he has been at the Bureau of Reclamation since 1976, and is a registered professional engineer. He has been responsible for explorations, testing, analyses, designs, specifications, and construction support for for several major dam projects. As a member of Reclamation's Performance Parameters Team, he was involved with the development of the Potential Failure Mode Analysis process for dam safety, and has been involved with many of these evaluations. He has been the leader of Reclamation's Comprehensive Facility Review Team, which develops and implements procedures for periodic in-depth dam safety evaluations, and has served as Senior Engineer on over 30 comprehensive facility reviews for concrete and embankment dams. While helping to implement Reclamation's risk analysis processes as a member of Reclamation's Risk Cadre, he has facilitated risk analyses for over 30 dams, including several for outside agencies. He is a member of Reclamation's Dam Safety Advisory Team, which reviews all dam safety studies and recommendations, and advises the Dam Safety Office on the appropriate course of action. He has authored over 25 technical papers in journals and conference proceedings related to dam engineering.

Our Nation's Water Infrastructure: Managing Risks to Secure Benefits

The United States enjoyed prosperous growth as a result of large Federal and private water projects beginning in the early 20th century. These projects provided water supply for crop irrigation, industrial and municipal use, power production, flood control, and recreation. Storage of water behind large dams was necessary to secure these benefits. As with most engineering efforts of large magnitude, significant technological advancements developed over the years, sometimes as the result of catastrophic failures. We continue to enjoy the benefits of these efforts, but much of the infrastructure is now aging. In addition, population growth has encroached into flood plain areas. Thus, we now face aging structures upstream of larger population centers. With limited economic resources to address these issues, it becomes increasingly important to identify those projects that pose the highest risk and direct resources toward those projects. Leaders of the future will need to exhibit technical competency in recognizing, evaluating, and mitigating the relevant risks. Risk, by definition, includes both likelihood and consequences of failure. Therefore, both of these factors must be evaluated in estimating risk. Dams, appurtenant structures, and water/power delivery systems are components of a larger system, and must be viewed in that light. In evaluating the risks, it is essential to understand the role and interaction of each component. If one component breaks down, the results could be catastrophic and life-threatening.

This talk chronicles some of the early developments in dam project design and construction, some of the failures that occurred along the way and the lessons learned, and a risk-based framework for evaluating the future safety of these projects.