



# United States Department of the Interior



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Mr. Kenneth R. See  
Office of New Reactors  
Division of Site and Environmental Reviews  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Subject: Use of Cristofano Method (1965) for Modeling Erosion and Failure of Embankment Dams

Thank you for your recent inquiry of April 18, 2008. This memorandum provides some additional information regarding our telephone conversation. The method developed in 1965, by Eugene A. Cristofano of the Bureau of Reclamation for computing the erosion rate for failure of an earthfill dam is no longer being actively used by our agency. In our agency, we would not accept its use today for potential dam failure studies without corroboration by other more recently developed methods that include analysis of real-world dam failure case histories and/or the use of physically-based numerical models of dam failure erosion processes. We typically also consider the use of procedures specific to the failure modes of concern, e.g., our internal erosion toolbox when that failure mode is a possibility. Our Dam Safety Office report DSO-98-004 issued in 1998, summarizes methods that were state-of-the-art at that time for modeling embankment erosion and failure and for predicting dam breach parameters. The latest revision of the internal erosion toolbox was presented at this year's United States Society on Dams meeting, April 28 through May 1, 2008, in Portland, Oregon. The development of improved numerical models for simulating embankment dam breach due to a variety of failure modes continues to be an active research effort for our agency.

Please contact Tony Wahl at 303-445-2155 if you have questions or comments.

Sincerely,

Craig H. Albertsen  
Acting Director, Technical Service Center