USCOLD LECTURES

1981	James Bay Hydro Development
1982	Tarbella Dam Project, Pakistan
1983	Bath County Hydroelectric Pumped-Storage Project
1984	Dam Safety and Rehabilitation

1984 SPEAKERS

David L. Hinchliff –	Hydraulic Design and Application of Labyrinth Spillways
Edward W. Gray, Jr. –	Fuse Plug Embankments in Auxiliary Spillways Developing Design Guidelines and Parameters
Lloyd O. Timblin, Jr. –	Flexible Membrane Emergency Spillway
C. O. Duster –	Dam Crest Raising With Reinforced Earth Retaining Walls
L.R. Carpenter –	Automatic Monitoring of Structural Behavior Instruments for Reclamation Concrete Dams
Raymond G. Acciardi –	Improvements to USBR Pinhole Test Equipment - Design and Test Result Evaluation
Douglas Craft –	Chemical Tests for Dispersive Soils - Problems and Recent Research
Luther Davidson –	Electronic Monitoring of Cement Pressure Grouting at Ridgway Dam

UNITED STATES
COMMITTEE ON LARGE DAMS

Dam Safety and Rehabilitation

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FOREWORD

USCOLD (United States Committee on Large Dams) has a strong commitment to dam safety, which is reflected in the topic for this Fourth Annual USCOLD Lecture, "Dam Safety and Rehabilitation."

In July 1966 USCOLD published "Supervision of Dams by State Authorities," because it was "concerned with the design, construction, and maintenance of dams to the end that good, safe, economical dams will be constructed and that the maintenance and operation of such structures will be safe and adequate."

In 1970 USCOLD submitted to State and Federal authorities the "Model Law for State Supervision of Safety of Dams and Reservoirs" to provide the States with guidelines for establishing a dam safety program for new and existing dams.

The American Society of Civil Engineers and USCOLD jointly published "Lessons From Dam Incidents, USA," in 1975. This book discussed several hundred U.S. dams that had experienced problems and the remedial measures taken to correct the deficiencies.

In January 1982 USCOLD distributed to all 50 States a resolution concerning "Safety of Dams in the United States." In this resolution, USCOLD stated its position that "a large number of dams in the United States do not meet current minimum acceptable safety criteria, that each State Government should actively pursue the supervision of dam safety for the protection of its population, and that the Federal Government should assist the States to develop their own capability in supervising dam safety."

In April 1982 USCOLD published "Dam Safety Practices and Concerns in the United States," which included papers on the current progress toward improving dam safety and other related topics. Furthermore, USCOLD formed its Dam Safety Committee, in 1982, to place additional emphasis on safety-related issues. All of these actions express USCOLD's intense interest in constructing and maintaining safe dams in the United States.

The USBR (Bureau of Reclamation) shares USCOLD's strong commitment to dam safety. The USBR is responsible for the safe operation of more than 275 dams in the Western United States. These dams, some of which date back to the early 1900's, present a wide variety of safety-related problems. A few of these problems and their solutions are discussed in this Fourth Annual USCOLD Lecture.

The evaluation of new hydrologic and meteorologic data has resulted in the need for increased spillway capacity at many USBR dams; but modification of an existing dam can be a difficult engineering task, requiring

creative and innovative solutions. Several techniques for accommodating new design floods are presented in this lecture. These techniques include installation of a labyrinth spillway, a flexible membrane spillway, and a fuse-plug spillway as well as the use of reinforced earth to provide additional freeboard capacity.

Dam safety awareness has also renewed interest in the timely monitoring of instrumentation at existing dams. A report is presented on the USBR's recently developed automatic system for monitoring instrumentation at several of its dams.

Dispersive soils were responsible for many dam failures during the 1960's and 70's. The early testing criteria developed by the Soil Conservation Service and Dr. James Sherard, et al., have been reanalyzed. The alternative testing procedures which have been developed are presented.

A dam currently under construction in western Colorado employed the first application in the United States of electronic monitoring of cement pressure grouting for a dam foundation. A paper is presented on the monitoring methods used, the problems encountered, and the solutions applied.

CONTENTS