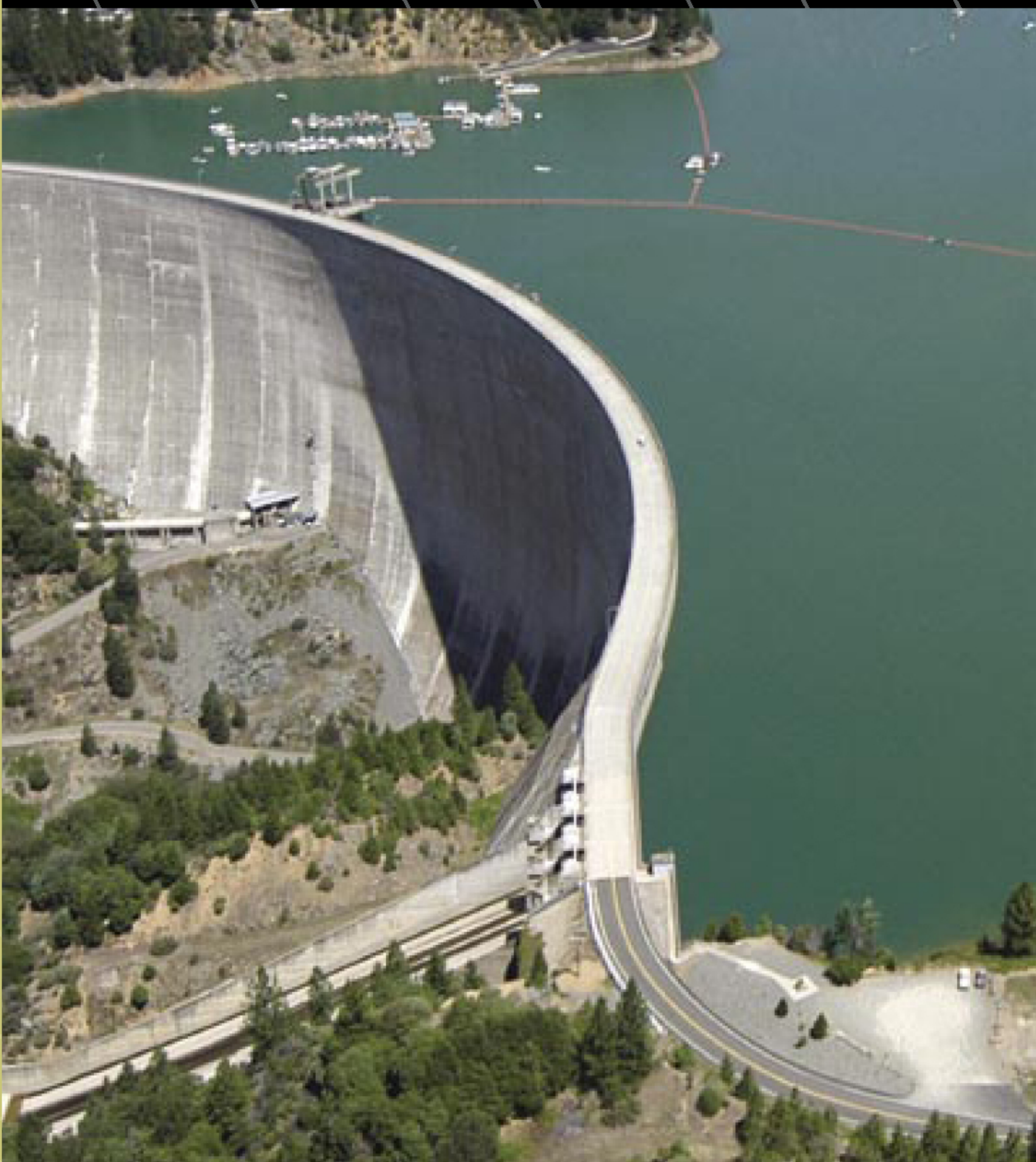
CALIFORNIA'S DAM SAFETY PROGRAM:

Safeguarding People & Property



MAJOR BENEFITS, CONSIDERABLE RISKS

Because of California's seasonal and climatic conditions, water storage is critical. Dams help reserve the water necessary for agriculture, hydroelectric power, recreational, environmental protection, and a stable drinking water supply. They are also critical tools in flood control. Along with their many benefits, dams present formidable consequences if not properly designed, built, and maintained.

All dam owners in California must be prepared for the inevitability of earthquakes and flooding. However, even without large-scale natural disasters, there are numerous causes of failure that can occur under less extreme conditions, including:

- Poor design
- Unsound construction
- Inadequate maintenance
- Age-related problems

St. Francis Dam during failure, near Los Angeles, CA (1928)

Baldwin Hills Dam after failure, Los Angeles, CA (1963)

Teton Dam during failure, Madison County, Southeast Idaho (1976)

DIVISION OF SAFETY OF DAMS – MORE THAN JUST INSPECTIONS

DSOD is composed of highly specialized engineers and geologists that work closely with dam owners and their consulting engineers to ensure the safety of dams in California. Division engineers independently review and evaluate designs of new dams which must meet state safety requirements. Enlargements and repairs of existing dams are also thoroughly analyzed.

Division engineers and geologists perform frequent inspections of dams under construction to verify compliance with approved plans and specifications. The 1,250 state-regulated dams are inspected at least once a year by DSOD engineers familiar with the history, performance, instrumentation, background, and unique details of each dam.

Although California dams are designed and maintained to the highest standards in the country, our state's seismic activity and extreme rainfall in some areas require today's DSOD staff to be experts in how earthquakes and floods affect such structures. Complex analyses are completed by engineers and geologists to predict dam performance during extreme conditions. Division engineers quickly respond to emergency situations, to assess performance and ensure downstream safety following natural disaster type loading.

Near failure of the Lower San Fernando Dam, San Fernando Valley, CA (1971)

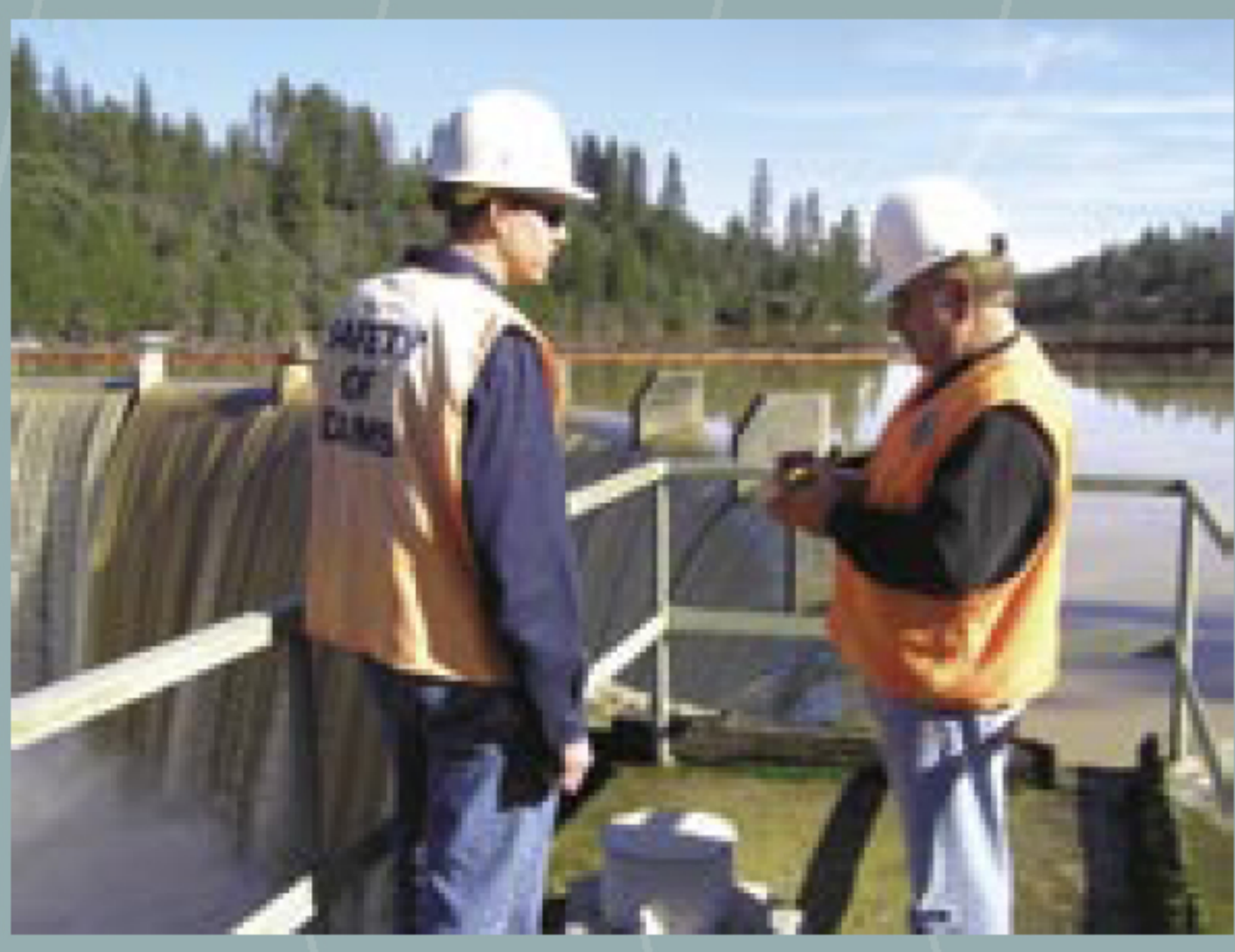
CLOSE CALL

During a 1971 earthquake, the near failure of the San Fernando Dam increased the focus on seismic safety of dams. Over 80,000 people lived downstream of the dam at the time of the earthquake. A DSOD water level restriction imposed before the earthquake, in combination with quick action taken by DSOD and the owner, helped to avert a major catastrophe.

THE SYSTEM WORKS BEST WHEN WE WORK TOGETHER

DSOD is constantly developing and applying new technologies in dam design, seismic fortification, testing, and maintenance. We work in close cooperation with other state and national organizations concerned with dam safety and public protection to ensure the most efficient use of our resources and to keep abreast of state-of-the-art in dam engineering. When dam owners work in concert with DSOD, they benefit from the collective experience of all of these organizations.

Cooperation, communication, knowledge, action, and a constant watchfulness will keep California's dams, and its people, enjoying the best protection possible.



DSOD engineers perform field inspections to assess the dam's structural condition and how well it is maintained.

THE CALIFORNIA CHALLENGE

On average, two dozen dams in the United States fail each year. Since 1970, significant dam failures have resulted in hundreds of lives lost and billions of dollars in property damage.

California has 1,250 state-regulated dams. Many of those dams are on the nation's highest hazard list because they pose a significant public safety threat due to their large size and proximity to major population centers. Other potential risk factors include:

- Many dams are located close to or on faults capable of generating major earthquakes.
- California has some of the most complex geology in the world, which affects the design and performance of dams.
- California's dams are aging. Most are over 50 years old.

Something Had To Be Done

In 1928, the 205-foot-high St. Francis Dam in Southern California failed. More than 12 billion gallons of water rushed down the San Francisquito Canyon, demolishing 1,200 homes, washing out 10 bridges, and killing approximately 450 people. The dam had been designed and constructed just two years earlier – without any regulatory oversight.

This sudden and tragic dam failure, one of the worst disasters in California's history, resulted in the creation of California's Dam Safety Program in 1929. Although dam owners are responsible for the safety of their own dams, the Department of Water Resources' Division of Safety of Dams (DSOD) is required by state law to regulate non-federal publicly and privately owned dams to prevent dam failure.

CALIFORNIA FAULTS
Jurisdictional Dam
Active Faults

Division of Safety of Dams
2200 X Street, Suite 200
Sacramento, CA 95818
916 227.4644
http://damsafety.water.ca.gov/