

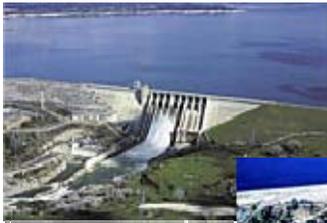
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# Folsom Dam being upgraded to handle biggest storm possible

'Probable maximum flood' could bring three times lake's capacity

Sacramento Business Journal - by [Melanie Turner](#) Staff writer

Folsom Dam is a complex machine providing flood protection for Sacramento and regulating water flows for competing municipal, industrial, agricultural, recreational and wildlife needs.



**Folsom Dam Safety and  
Flood Damage Reduction  
Joint Federal Project**

It takes hundreds of federal employees to keep Folsom Dam operating, though computers and technology have made dam operations more efficient since it was completed in 1956.

Today, a major rehabilitation is under way while the dam continues to deliver water and power.

“Never before has so much been happening so quickly on upgrades,” said Steve Geissinger, a public affairs specialist for the **U.S. Bureau of Reclamation**'s Mid-Pacific Region. Geissinger declined to disclose exactly how many federal employees support

the dam, citing security concerns.

The dam, which regulates flows of the American River, is a key feature of the Central Valley Project, a system of dams, reservoirs, canals and power plants that provides hydroelectricity, drinking water and water for irrigation and other uses.

The modern upgrades — part of the Bureau of Reclamation's Infrastructure Reliability and Safety of Dams improvements — are meant to ensure that the dam and reservoir can provide increased flood protection for Sacramento.

## Auxiliary Spillway under way

The Safety of Dams project is the largest such project in the Bureau of Reclamation's history, said Rob Schroeder, chief of the resource management division for the Central California Area Office. The bureau was established in 1902 to bring water to 17 Western states.

“We're undergoing a major rehabilitation of the dam to bring it up to the current state-of-the art,” said Larry Hobbs, Folsom Safety of Dams project manager.

While it was state-of-the-art when it was built — between October 1948 and May 1956 — scientists today are better at understanding earthquakes and meteorology, Hobbs said.

“We’re trying to prevent another (Hurricane) Katrina,” he said.

Originally authorized in 1944 as a 355,000 acre-feet flood control facility, Folsom Dam was reauthorized in 1949 for about 1 million acre-feet in storage capacity. One acre-foot is enough water to cover an acre of land in a foot of water.

Since then, it has been determined that the biggest storm that could occur — the “probable maximum flood (PMF) event” — could bring about three times the amount of water that Folsom Lake can hold today.

“The biggest storm that we can predict is significantly larger than science understood in the mid-1950s,” Hobbs said.

The bureau and the **U.S. Army Corps of Engineers** jointly developed the PMF in 2001 using data from many agencies, but principally from the **National Weather Service**. An auxiliary spillway under construction now is meant to keep the dam, and community, safe during such an event.

“Upon completion, the (joint federal project) spillway, in combination with the existing release capacity from the main dam, is designed to release the PMF event without over-topping the facility,” Hobbs wrote in an e-mail.

The spillway project represents an unprecedented partnership among the bureau, the Corps, the Central Valley Flood Protection Board and the **Sacramento Area Flood Control Agency**.

The cost of the auxiliary spillway — along with Folsom Lake Crossing, a bridge that opened in March 2009 to bypass the dam — totals \$1.5 billion, Hobbs said. Twenty percent of the spillway is being paid for by the Bureau of Reclamation. The rest comes from the Corps, SAFCA and state funding.

Martin Brothers Construction of Sacramento was awarded a \$62.5 million contract in April 2009 for Phase 2 of the spillway. Work already has been done to excavate a 3,000-foot-long spillway chute. The Corps is expected to award a Phase 3 contract in September. Project completion is anticipated in 2015.

### **Other upgrades**

Folsom Dam is made up of a main concrete gravity dam that stands 340 feet high and 1,400 feet long, and 11 earthen impoundments that were built in a series of low spots around Folsom Lake. They include two earthen wing dams that flank the main dam, eight dikes and Mormon Island Auxiliary Dam.

Safety upgrades began at the dam in 2007. So far, upgrades have been made to three dikes and the wing dams. Mormon Island, on the edge of the lake near Green Valley Road and the city of Folsom, also is to be rebuilt. The first of two contracts for that job is set to be awarded at the end of August.

Two Folsom Dam projects, including one safety-related project, have been funded by the American Recovery and Reinvestment Act of 2009. The federal act gave \$3 billion to the **Department of the Interior**. Of that, \$24.4 million has gone to Folsom Dam.

The Bureau of Reclamation in March awarded a \$7.8 million contract under the Recovery Act to Abide International of Sonoma to refurbish fixed wheel gates and minor support structures at the dam. Fixed wheel gates are vertical valves that control the flow of water in a pipeline that transfers water from the dam to the adjacent hydroelectric plant.

In April, the bureau awarded a \$16.6 million contract under the federal Recovery Act to **Kiewit Pacific Co. of Concord** to make seismic improvements to Folsom Dam's spillway piers and gates. The project involves making improvements to the existing dam gates and piers, including the installation of pier anchors and bracing, the replacement of existing gate arms and other equipment and support activities.

In all, the bureau budgeted \$520 million for its Safety of Dams projects, Hobbs said. Stimulus funding has helped bring the cost down to \$408 million. Ultimately, safety improvements are expected to come in 50 percent below budget and four to five years ahead of schedule.

"We think we'll get it down to \$300 million," Hobbs said.

The economy also is helping.

"It helps to have contractors fighting over the lowest bid," Schroeder said.

In all, safety projects at the dam will provide an estimated 9,000 jobs, including 3,000 construction and other on-site positions, and 6,000 jobs for suppliers and service providers, according to the Central California Area Office, which manages water and land resources in 12 counties.

With spending at about \$150 million, so far an estimated 3,000 jobs have been created. Of those, the spillway project has generated about 300 jobs and another 250 jobs are expected on the Mormon Island project.

The Corps originally built Folsom Dam and then transferred it to the bureau to operate as part of the Central Valley Project, the nation's largest water development project. The project is a system of 20 dams and reservoirs, and 500 miles of major canals, power plants and other facilities, mainly in the Sacramento and San Joaquin valleys.

### **By the numbers**

**Location:** 23 miles east of Sacramento

**Dimensions:** 340 feet high, 1,400 feet long

**Owned and operated by:** U.S. Bureau of Reclamation

**Capacity of existing spillway:** 567,000 cubic feet per second

**Folsom reservoir:** Catches runoff from the American River watershed and has a storage capacity of about 1 million acre-feet.

**Length of dams:** The main dam, wing dams, dikes and an auxiliary dam together are more than 5 miles in length.

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