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New operating manual needed for Folsom Dam upgrade

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Nearly a billion dollars for a massive new spillway and flood-control gates at Folsom Dam promises a new level of protection for the Sacramento region.

The full impact of one of the nation's most ambitious dam upgrades, however, won't be measured for some time because a rewrite of rules governing the reservoir's flood-control operations is late getting started.

Construction of the spillway is on track, an important achievement given setbacks four years ago caused by unexpectedly high bids for an earlier project design. Now, excavation is nearly complete, and the U.S. Army Corps of Engineers expects concrete to be poured in about a year.

But perhaps because of the tight focus on construction, work has yet to start on a new set of rules that will dictate how the dam is managed.

The spillway will be finished in 2015 and Gary Estes, a board member of the American River Watershed Institute, said the rules rewrite should have begun by now, so that all key players in the dam's operation have time to address potential conflicts over everything from flood protection to salmon habitat.

Like software that runs a computer, the rules are a framework for dam operations. Without the rules, Estes says, the dam would be like a new computer running on outdated software.

The rules are essential to protecting more than a million people downstream from floods, and ensuring the dam provides enough water at the right times for people, crops and fish.

"If the manual isn't changed, the hardware doesn't do any good," Estes said. "Anybody who's a user of Folsom Dam is going to be interested in what happens."

Called the Folsom Dam Joint Federal Project, the $1.5 billion job – which among other things also includes raising the dam's height 3 1/2 feet – is a rare partnership between the U.S. Bureau of Reclamation, which owns the dam, and the Army Corps, which is responsible for flood protection.

The agencies jointly produced the spillway design.

"This project has been on schedule for 48 months now, which is basically unheard of," said Col. Tom Chapman, commander of the Army Corps Sacramento District. "We've got the money, we've got the people, and we're postured to do it."

The new spillway will include a 3,000-foot-long concrete channel, adjacent to the existing main dam, and six giant new flood-control gates. Estimated cost: $919 million.

By comparison, construction of the original Folsom Dam, completed in 1956, cost about one-third

as much when adjusted for inflation.

Chapman said a $250 million contract to pour concrete for the spillway will be the largest ever signed by his district.

The Folsom Dam project is considered one of the nation's most important flood-control efforts.

Because the new spillway gates will be lower in elevation, they will allow major water releases further in advance of big storms, increasing the reservoir's ability to hold incoming floodwater.

The project is expected to roughly double flood protection for the Sacramento region, recognized as second only to New Orleans for flood risk among U.S. metropolitan areas.

But there's more at stake than flood control.

Dam operations affect water supplies for Sacramento-area water agencies, imperiled salmon and steelhead runs in the American River, water quality in the Sacramento-San Joaquin Delta, recreation on Folsom Lake and in the river downstream, and irrigation supplies for farmers as far away as Bakersfield.

The Army Corps must consider the competing interests as it prepares the new reservoir operations manual, experts say. Balancing them all will require a complex environmental impact study.

"The flood control part of it is pretty easy," said Joe Countryman, a former Army Corps engineer in the Sacramento District and now president of MBK Engineers, a Sacramento consultant. "The big issue is going to be how all the fishes in the American River will be impacted downstream. This could be a major deal."

All who rely on Folsom Dam, including fish, could benefit from the spillway and its operating rules. But verifying that will take years of study.

Creg Hucks, Army Corps program manager, acknowledged a new operations manual will be a huge effort. He expects the agency will soon publish a schedule for what's expected to be a four-year process.

"When we finish the joint federal project, we will obviously want to have an operations manual ready to go," Hucks said. "I'm confident we will have it ready by then."

Also uncertain is whether the Army Corps will incorporate "forecast-based operations" into a new rulebook. This new way of thinking about dam operations is designed to integrate weather prediction with flood-safety and water-supply decisions.

Today, dam operators must maintain a certain amount of storage space in the reservoir during winter – regardless of weather, water shortages or drought conditions – to hold back potential floods.

The reservoir can't be filled in winter, even in a drought when farms and cities might need water saved for later.

This approach is based on a cautious, 1950s engineering practice, in place before the first weather satellites were launched.

Forecast-based operations exploit huge strides in weather prediction to improve flood safety and water storage.

For instance, if a major storm is predicted, forecast-based operations would trigger quick water releases to hold back a flood. Folsom Dam's new auxiliary spillway is designed for this.

Conversely, if a forecast storm looks small or likely to miss the watershed, operators would be allowed to keep more water stored in case of drought later in the year.

Forecast-based operations are widely recognized as an important and cheap tool for flood protection and stretching water supplies. They are expected to become even more important amid a changing climate, which may shrink the region's snowpack and make juggling scarce freshwater supplies more difficult.

Still, weather forecasting has not been added to any California reservoir operations manual.

In its 1999 authorization for new projects at Folsom Dam, Congress directed that the Army Corps "shall update the flood management plan for Folsom Dam … to reflect … improved weather forecasts."

Hucks, however, said the directive does not require forecast-based operations.

"I would say they are requiring that we look into it," he said. "We believe it's a good idea, but we need to prove that out before we go final with it."

Whatever happens at Folsom Dam, Countryman said, is likely to set an important example for other reservoirs in California and across the nation.

"I definitely think it's going to pave the way," he said.

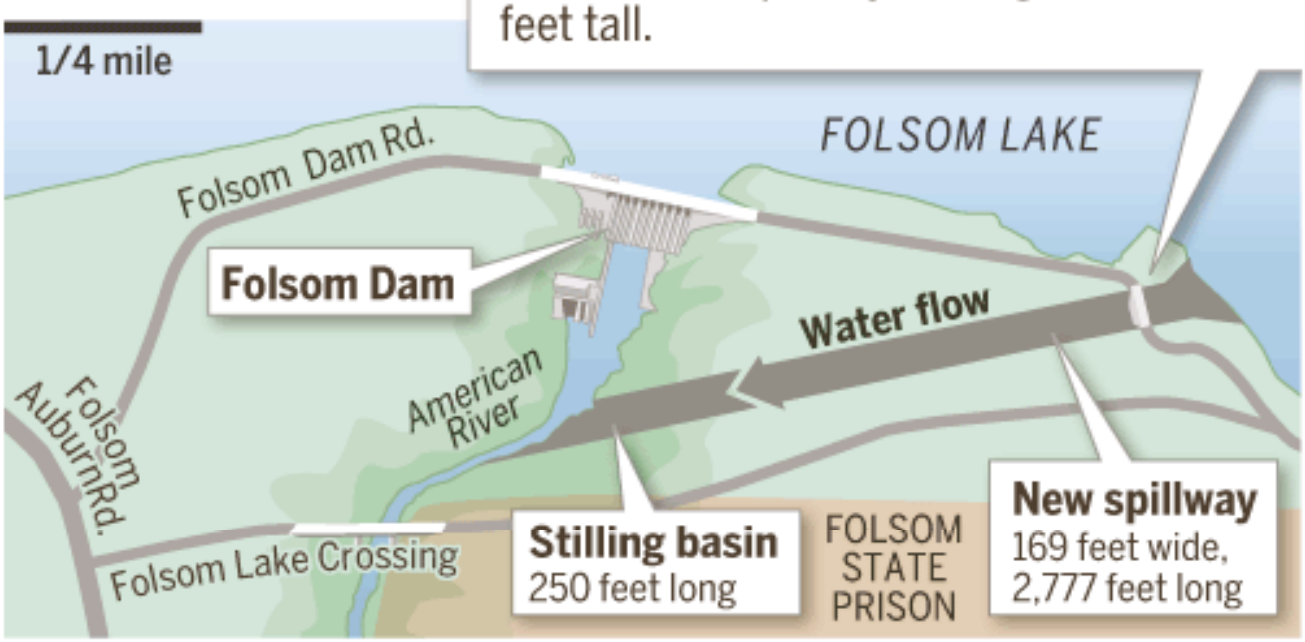
Call The Bee's Matt Weiser, (916) 321-1264.

NEW SPILLWAY

A new auxiliary spillway near Folsom Dam will allow large quantities of water to be released earlier during storm events, improving the dam's ability to handle large storms. The U.S. Army Corps of Engineers expects to award a contract for the $919 million project in September 2010.

U.S. Army Corps of Engineers

Control structure: This artist's rendering shows the six gates that will release water into the new spillway. Each gate will be 36 feet tall.



Sources: U.S. Army Corps of Engineers, U.S. Bureau of Reclamation

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