



The Sacramento Bee

Engineers have known for decades that Oroville's backup spillway was unreliable

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Engineers have known for decades that if water ever spilled onto Lake Oroville's unpaved auxiliary spillway, it would cause serious erosion, possibly compromising the earthen structure that holds back the reservoir and threatening communities downstream.



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But California water districts that helped pay for Oroville resisted calls to armor the backup spillway, which would have required construction outlays in the tens of millions of dollars. Environmentalists, meanwhile, opposed an earlier proposal to install gates atop the structure to raise the dam's elevation and prevent water from topping it during a flood.

The resulting stalemate contributed to Oroville's near catastrophe on Sunday, when nearly 200,000 people were ordered to evacuate after officials detected erosion on the unlined hillside.

Congressional representatives said Monday they were stunned to learn that Oroville did not have a backup spillway paved with concrete that could be safely used if the main one was damaged.

“The emergency spillway remained basically a dirt, soil rock facility, and it worked fine until it had to be used, in which case it didn’t work so well,” said U.S. Rep. John Garamendi, D-Walnut Grove.



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“When I think about the fact that the (auxiliary) spillway at Oroville did not even have concrete lining on it, I’m just really surprised,” said Rep. Doris Matsui, a Democrat from Sacramento. “I would think that would be the first thing you could do.”

“Some hard questions have to be answered about why this facility was apparently neglected in a way that left it vulnerable to these problems,” said Rep. Jared Huffman of San Rafael, the top Democrat on the House subcommittee with oversight over dams. “Clearly there were warning signs, there were people saying, ‘we need to fix this.’”

With the tallest dam in the United States, Lake Oroville is the major water source for the State Water Project, which provides water for 23 million people and farmers in the San Joaquin Valley. It was financed with a \$1.75 billion bond that California voters approved in 1960. Some 34 laborers died during its construction.

The dam was designed with a main spillway, which was gated and lined with concrete. The ungated auxiliary spillway was added to handle a flood so big that “no one could imagine it,” said Joe Countryman, a former engineer with the U.S. Army Corps of Engineers. As a result, he said, California and the water contractors “didn’t want to put a lot of extra resources” into lining that spillway, which is basically an earthen hillside.

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Many groups knew that, if the reservoir were ever hit by a major flood, water toppling over the emergency spillway would cause serious erosion. In 2002, the Yuba County Water Agency – which owns transmission lines and other infrastructure in the area – highlighted these concerns in a technical memorandum.

“The discharge area below the emergency spillway is not armored, and extensive erosion would take place if the emergency spillway were used,” the [memo](#) stated. “The spillway road and possibly high voltage transmission towers would be impacted.”

In 2003 through 2005, three environmental groups – Friends of the River, the South Yuba Citizens League and the Sierra Club – urged the federal government to require the lining of the auxiliary spillway as part of the dam’s licensing process.

“At present, the ungated spillway at Oroville Dam consists of a spillway lip only – and utilizes a hillside as the project spillway,” the groups wrote in 2003 to the Federal Energy Regulatory Commission. “Utilizing such a spillway has the potential to cause severe damage to the downstream hillside, project facilities and downstream environments located in the path of the flood release.”



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Despite such concerns, FERC ultimately decided not to require lining of the spillway, as the San Jose Mercury News reported Sunday. A senior engineer told his manager that it would take a “rare event” to utilize the emergency spillway and that using it “would not affect reservoir control or endanger the dam.”

Late last week, engineers discovered a gaping hole in the concrete of Oroville’s main spillway, following heavy releases from the reservoir. To stem the damage, they reduced flows going down the spillway, allowing the reservoir level to rise and spill over the auxiliary spillway for the first time in the dam’s 48-year history.

The result was severe erosion at the base of the spillway, along with “severe damage to the downstream hillside” – just as the three environmental groups had predicted.

“I am not proud of the decisions they made a decade ago,” said Ron Stork, policy director with Friends of the River, one of the groups that pressed the issue.

Oroville provides water to the State Water Contractors, which includes the powerful Metropolitan Water District of Southern California, as well as water districts in Silicon Valley and Kern County. Documents from 2006 show that lawyers for the State Water

Contractors downplayed the risk of the unlined spillway, and argued that relicensing was the wrong forum to address such issues.

In their [response to FERC](#) on concerns raised by environmentalists, the State Water Contractors challenged claims that failure of the auxiliary spillway could lead to flooding on the scale of what happened in New Orleans in 2005. “Neither FOR (Friends of the River) nor Butte County have offered any evidence to support speculation that dam failure is likely to occur,” said the water contractors.

In a conference call with reporters, Jeff Kightlinger, general manager of the Metropolitan Water District, pushed back against claims that MWD and water contractors resisted paying for the spillway lining. “On that issue, we did not say it was a cost issue,” Kightlinger said Monday. “We said that was an issue that needs to be decided in the appropriate forum.”

Kightlinger added that the State Water Contractors typically pay for project upgrades that involve water supply, while federal and state partners typically pick up costs for flood control upgrades. It remains to be seen if the water contractors may need to help pay for repair costs on the main spillway, which state officials say could be in the range of \$100 million to \$200 million.

Countryman, a flood-control consultant formerly with the Corps of Engineers, said that the 2005 FERC proceedings were the second time in a decade that Oroville’s backup spillway was a focus of debate. Following the devastating 1997 floods in Northern California, Countryman said he urged the California Department of Water Resources to add special gates atop Oroville’s auxiliary spillway. Such gates, he said, would have allowed the reservoir to rise an extra 10 feet.



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But, according to Countryman and others, environmental groups opposed the gates, because they would have allowed water to back up into tributaries of Oroville that are protected by federal wild and scenic status. The proposal died. “Everyone was for it except for the concerns it created for wild and scenic rivers interests,” he said.

Lester Snow, former director of the California Department of Water Resources, said he hasn’t had time to go back and review disputes about upgrading Oroville Dam in the 1990s and the following decade, when he was running DWR.

“The biggest issue of concern for me is what happened to the gated spillway,” said Snow. “The whole design is based around being able to let out water before it ever gets to the emergency spillway.”



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Videos: What you need to know about the massive Oroville Dam emergency in California. California is trying to avert disaster at the tallest dam in the United States. With the possibility of more rain on the way, engineers are working as quickly as possible while evacuees are uncertain when they will be able to return home. The Sacramento Bee & McClatchy

<http://www.bellinghamherald.com/news/nation-world/national/article132552669.html>

Under threat of Oroville dam, hundreds find shelter at Nevada County Fairgrounds. After braving 2-1/2 drives to avoid potential flooding near Marysville, 650 people at the Nevada County Fairgrounds await word on when they can return home after threats from damage at the Oroville Dam spillway. The Red Cross is operating the shelter. Monday, February 13, 2017. Peter Hecht The Sacramento Bee

<http://www.sacbee.com/news/state/california/water-and-drought/article132429274.html>

Trucks, helicopters dump loads of boulders in rush to fortify Oroville dam spillway. Sacramento Bee reporter Ed Fletcher was on the scene at Oroville Dam as crews worked to fortify the emergency spillway. Boulders were being dumped into the heavily eroded spillway by truck and helicopter. Ed Fletcher The Sacramento Bee

<http://www.sacbee.com/news/state/california/water-and-drought/article132540029.html>

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