



Shasta Dam and Reservoir

Overview

Shasta Dam and Shasta Reservoir are located about nine miles northwest of Redding, CA on the Sacramento River. Built between 1938 and 1945, the concrete gravity dam is 602-feet high and provides flood control, power, and water supply benefits. It is the largest reservoir in California with a 4.5 million acre-feet capacity and is also used extensively for recreation. Shasta Dam and Shasta Reservoir are key facilities in the Central Valley Project (CVP). The water stored in Shasta Reservoir represents about 41% of the stored water in the CVP.

Shasta Dam Construction

Initial Shasta Dam construction began in 1938, with excavation and the relocation of the Southern Pacific Railroad that ran through the dam site. A tunnel was blasted through the nearby hillside to detour the train, moving the rail line away from the excavation work.

Along the Sacramento River in Redding, CA aggregate was gathered and sent to stockpiles near the dam site by way of a 9.6-mile-long conveyor belt - the longest one in the world. The conveyor belt delivered tons of gravel used in the concrete mix to build the dam.

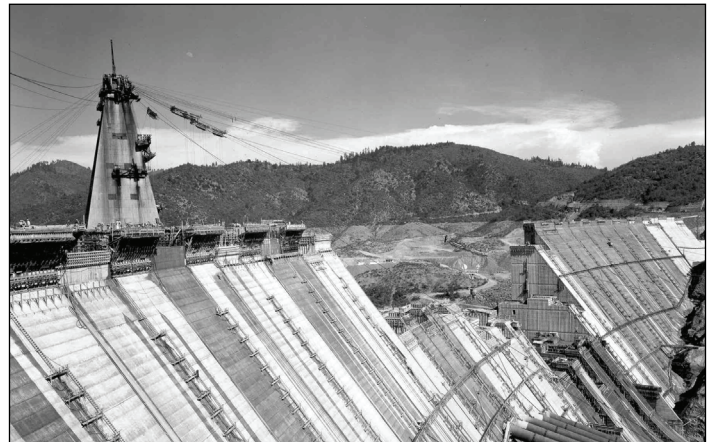
With excavation complete, dam construction began. Freshly mixed concrete was delivered to forms, 50-foot square and five-feet deep, using eight-cubic yard steel buckets suspended from a cableway system, to efficiently move huge amounts of concrete to waiting crews.

These massive blocks were built one on top of another, first to form the abutments, and finally finishing the dam by completing the spillway. As the abutments rose, crews



The last bucket of concrete placed to construct Shasta Dam

were busy building the permanent relocation track for the Southern Pacific Railroad. When the new railroad track was completed, the train traveled across the Pit River Bridge high above the river below.



An extensive cableway system helped deliver concrete where it was needed during construction of Shasta Dam.

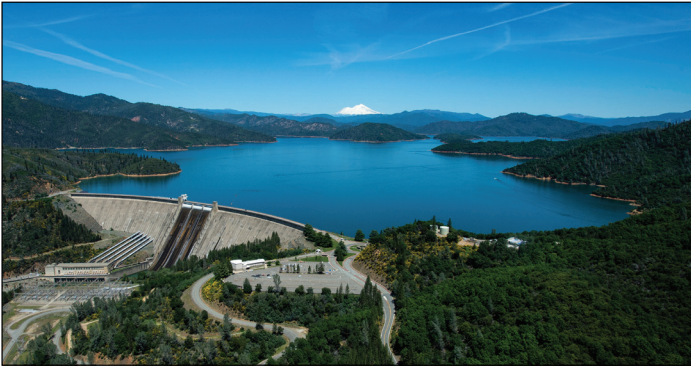
To allow workers to start excavation in the river channel for the spillway, an earthen coffer dam was built across the river upstream of the dam site, causing the river to rise and find the empty railroad tunnel. The river now flowed past the dam site through the railroad tunnel, just as the train had in past years. With the river successfully diverted and excavation completed, spillway construction began.

The spillway construction included installing 18 river outlet valves, placed at three different elevations. Once installed, the river rose and flowed through the lower of these valves, returning to its original course. Eventually, the reservoir rose high enough to send water through powerplant generators at the base of the dam.

Because of the hard work and determination of many, this massive dam was completed in 1945 – 22 months ahead of the original schedule. This amazing feat was accomplished despite many obstacles.

Shasta Dam - System Design

- Height - 602 feet (138.5 meters)
- Concrete volume - 6,541,000 cubic yards - 5,001,000 cubic meters)
- Crest length - 3,460 feet (1,054.6 meters)
- Thickness - 883 feet (269.1 meters) (base with spillway apron)
- Crest width - 30 feet (9.1 meters)
- Downstream face - 31 acres (12.5 hectares)
- Weight - 5 million tons (13,607,771.1 metric tons)
- Cost - \$121,000,000



Shasta Reservoir

Roughly 90% of the water stored in the Shasta Reservoir is primarily from rainfall. Shasta works within a complicated network of water storage and delivery within Northern and Central California. At different times during the year, reservoirs are called upon to deliver water to help repel salinity or keep temperatures cold enough for salmon. It's a careful orchestration that requires deft anticipation and response, considering the narrow amount of water over which Reclamation has discretionary control.

The Shasta Reservoir is fed by the Sacramento, Pit, and McCloud rivers. Although recreation is popular, the water's primary use is for irrigation, municipal and industrial needs, salinity control for the Sacramento-San Joaquin Delta, and to meet environmental and fishery needs.

Rain matters! Ninety Percent of the water that fills the reservoir each year comes from rain.



Shasta Powerplant sits beneath the dam and receives water via five penstocks.

Shasta Powerplant

Shasta Powerplant is located at the base of the dam and helps managers maximize the benefit of water stored in Shasta Reservoir. Water released to meet downstream commitments passes through five generators, causing them to spin and generate clean hydroelectric power to meet project demands (pumping plants, etc.), as well as for distribution to the power grid.

Sale of federal hydropower generated at Shasta Powerplant is managed by the Department of Energy's Western Area Power Administration that receives a share of the federal hydropower. Preference customers include federal and state agencies, cities and towns, rural electric cooperatives, public utility districts, irrigation districts, and Native American tribes. The sale of this electricity produces millions of dollars in annual revenue for the federal government.



Five power generators operate inside of the Shasta Powerplant.