The Unfinished Emergency Spillway Should Never Be Used Again
(December 2023)

The existence of the dam has resulted in Oroville being faced with 2 evacuations in the last 25 years caused by the threat of catastrophic inundation. Prior to the Dam, the problem was regular seasonal floods which the community had learned to deal with. This was not a good trade. So, it is not surprising that the most important concern for downstream communities is for the Dam operator to minimize the chance of there being future conditions that might result in inundation.

The 1997 incident was caused by hydrologic conditions that resulted in the DWR forecasting that releases from the Dam would reach 300,000 cfs within 24 hours. But fortunately, the rain stopped. If it had not, uncontrolled flows down the emergency spillway would have been some 100,000 cfs and the problems of erosion of the spillway would have obstructed the river and the Hyatt Powerhouse would probably have been submerged. Climate change makes the recurrence of similar or more dangerous precipitation more likely.

The 2017 incident was the result of poor management. The main spillway had not been properly inspected or maintained and the DWR records of the certainty of emergency spillway erosion had been overlooked. The improvement in the DWR management, the strengthening of enforcement by FERC and perhaps the oversight of the OCAC have made the recurrence of inundation resulting from poor management unlikely.

But, the chance of more dangerous rainfall and snowmelt, leading to inflows into the lake higher and longer lasting than in 1997 remains significant. The CNA concluded that the risk of this was acceptable but unless steps are taken to reduce the risk this does not seem to be a reasonable conclusion based on the experience in 1997 and earlier flood years. Knowledgeable professionals have suggested that it is inevitable that the level of inflows to the reservoir will require the emergency spillway to be used within 50 years and then obstruction of the river would have unpredictable consequences. So, it is reasonable to conclude that the odds of inundation and another evacuation in the next hundred years are worse than one hundred to one.

The consequences of high outflows from the Dam will be no more than those experienced from floods before the Dam was built, so long as the structure of the Dam does not fail, the river does not get obstructed and the outflow from the reservoir is only through the dam. But if any one of these conditions is not met, the damage could amount to tens of billions of dollars and the supply of water could be disrupted for months or years.

Assuming the Dam structure does not fail, the steps which could be taken to mitigate these consequences are:

- Incremental improvements to the crest parapet walls and the abutments on the Dam and the raising of the Parish Camp Saddle Dam. Raising the Parish Camp Saddle Dam

would contain the more water within the Dam system but would force more water down the emergency spillway in extreme conditions and exacerbate the erosion.

- Hardening the emergency spillway down to the river. This would remove the risk of the lower river being obstructed and thus the consequences of extreme precipitation and snow melt would be no worse than those experienced before the Dam was in place.
- Providing a low-level outlet which would make it possible for water to be released sooner if dangerous precipitation was anticipated, allow the reservoir to be emptied more quickly if the Dam were damaged by, say, an earthquake and have other benefits not directly related to safety.
- Increasing the flood pool. The flood pool is being considered in the revision of the Water Control Manual. Implementation the steps to mitigate the risk of inundation should be a major factor in determining the flood pool. As long as the lower half of emergency spillway remains unprotected hillside, the flood pool should be large enough to make the need to use the emergency spillway unnecessary in any foreseeable circumstances.

At present, the downstream communities are faced with a real risk of evacuation and inundation in future. The cost of these will range from the some $2 million incurred without compensation during the evacuation in 2017 to billions of dollars if control of the releases was lost or the river below the Dam seriously obstructed. If the worst happened, the consequences would be devastation of downstream communities and significant loss of life.