

Nevada Irrigation District

2019 Dam Safety Activities Report

Nevada Irrigation District (NID) owns and operates 15 dams under the jurisdiction of California Division of Safety of Dams (DSOD). All of these dams, except two, are also under the jurisdiction of Federal Energy Regulatory Commission (FERC). These regulatory agencies enforce their respective comprehensive dam safety programs on their jurisdictional dams. The Hydroelectric Department is the District's lead in ensuring safety of the dams, with support from the Engineering, Water Operations, and Water Maintenance Departments. In addition to satisfying the regulatory requirements, the Hydroelectric Department has its own on-going improvements of various dam-safety related facilities and ancillaries. The following summarizes the dam safety activities performed in 2019 by the District:

1. Inspections and Monitoring

In addition to the District's weekly (as conditions permit) and monthly inspections of the dams, DSOD and FERC performed their annual inspections in September 2019. (Note: The upper-division dams are inspected approximately monthly from a helicopter when the dams are covered in snow and the access roads are not passable by a regular vehicle.) The District prepared and submitted to FERC and DSOD the annual Dam Safety Surveillance Monitoring Reports, which cover the dam safety findings, issues, maintenance activities, instrumentation readings, and self-evaluation of the dam performance. The District updated the Dam Safety Surveillance and Monitoring Plan (DSSMP) in December 2019.

2. Evaluations and Assessments

- a. An extensive field and lab exploration for Scotts Flat Spillway was performed in 2018, and the Geotechnical Data Report (GDR) was completed in 2019. The GDR provides critical basis for the spillway upgrade alternatives development, which commenced in October 2019. The spillway upgrade design is planned to start later in 2020.
- b. The 2018 blanket review of the seismic stability of the eleven jurisdictional embankment dams using the updated seismic ground motions found that Loma Rica Airport Dam lacks necessary foundation materials information. As a result, a subsurface investigation program was performed and completed in 2019. In addition, it was found that Scotts Flat Dam, Rollins Dam, and Jackson Lake Dam need further evaluation to decide their seismic stabilities.
- c. The seismic stability evaluation for Combie Dam was completed in 2019. It was found that the gravity sections toward the ends of the abutments might be unstable during the maximum flood. Stabilization of these end sections will be integrated with the protection of the groins against scouring in the 2020 alternatives development for a solution to ensure safe passage of the maximum flood flow.
- d. A blanket hydrologic and hydraulic (H&H) update for most of the jurisdictional dam reservoirs was completed in 2019. In addition, the inundation maps were also redone in 2019 to satisfy the new DSOD and California Office of Emergency Services (CalOES) requirements.

- e. The District's Dam Safety Program was audited by two highly experienced independent consultants specialized in dam safety engineering and practices. The audit report has been completed and submitted to FERC for review and approval.

3. Emergency Action Plans (EAPs) and Annual Seminar

To meet the new requirements from DSOD and the CalOES, the District has redone the EAP and included the new inundation maps. The major updates have been submitted to both CalOES and FERC for review and approval.

A FERC-mandated Annual Emergency Action Plan Seminar was performed at the District Grass Valley Headquarters on September 18, 2019 with a total of 43 attendants from 16 authorities and emergency response agencies.

4. Dam Safety Training

The annual dam safety inspection training was conducted on December 18, 2019. Thirty-five District staff members involved in dam safety participated in the training. The 2019 training topics include the dam safety performance and monitoring program, dam-specific potential failure modes and monitoring efforts, and the related environmental compliance.

5. Other Improvements and Activities

In 2019, the District:

- a. Repaired the spalling and damaged joints at the spillways of the Dutch Flat Forebay, the Dutch Flat Afterbay, Jackson Meadows, and Scotts Flat.
- b. Surveyors completed the topographic survey for the Scotts Flat Spillway Upgrades Project.
- c. An extensive investigation of the conditions of the drain pipes at Scotts Flat Dam was completed and a report was submitted to DSOD and FERC for review and approval. Improvements to the drain pipe system have been planned for 2020.
- d. Completed the Rollins Low Level Outlet Howell Bunker Valve (HBV) Replacement Project, after years of planning and preparation to meet the strict environmental laws, regulatory requirements, operational constraints, and tight installation schedule. The new 60" stainless fixed-cone HBV was successfully installed in October 2019.
- e. Performed underwater inspections and repairs of drain outlet operating systems for French Dam, Combie North, and Jackson Lake Dam.
- f. Completed full cycling of all of the drain valves and radial gates, and repairs of any malfunctioning operating components.
- g. Constructed a bypass pipe and installed an 8-inch gate valve to improve operations of the 66-inch butterfly guard valve at the low-level outlet of Bowman North Dam.

6. Summary of Significant (>\$100,000) Modifications and Studies of Dams Completed in 2019

Dam	Component	Summary of Work
Rollins	60-inch fixed-cone Howell-Bunger valve of the low level outlet	Replaced the 60-inch-diameter fixed-cone valve and upgraded the valve operator and power system. Work was completed in October 2019.
Combie Dam	Seismic Stability Evaluation	Completed sophisticated 3-D finite element analyses of the arch dam, and found the weakness needing improvements.
Most Jurisdictional Dam Reservoirs	H&H Studies, and Inundation Maps Revisions	Completed the H&H studies using the most updated standards to satisfy FERC mandates. Completed the inundation maps to meet the DSOD and CalOES requirements.