



Monterey County

Board of Supervisors
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Board Report

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Consider receiving a report on the Nacimiento Dam 7th Federal Energy Regulatory Commission Part 12D Safety Inspection Report findings and recommendations.

RECOMMENDATION:

It is recommended that the Monterey County Water Resources Agency Board of Directors:

Receive a report on the Nacimiento Dam 7th Federal Energy Regulatory Commission Part 12D Safety Inspection Report.

SUMMARY/DISCUSSION:

Pursuant to Title 18, Chapter 12 of the Code of Federal Regulations (18 CFR 12) titled "Safety of Water Power Projects and Project Works", Nacimiento Dam is regulated with regard to dam safety matters by the Federal Energy Regulatory Commission (FERC) Office of Energy Projects, Division of Dam Safety and Inspections as a condition of operating the Nacimiento Hydroelectric Plant. Pursuant to 18 CFR 12, Part D, every five years a qualified Independent Consultant, in summary, must review project records, inspect the dam and its appurtenant structures, identify potential failure modes, and prepare a report with findings and any recommendations needed for the safe operation of the dam and compliance with FERC regulations. An Agreement with GEI Consultants, Inc. was approved by the Board of Directors in June 2018 to complete the Nacimiento Dam 7th FERC Part 12D project records review, safety inspection, potential failure mode analysis, and report. Qualified GEI Independent Consultants, FERC staff and Monterey County Water Resources Agency engineering and maintenance staff participated in the inspection and potential failure mode analysis workshops. The report was completed in April 2019.

The GEI Independent Consultants, upon evaluation of project records, the safety inspection, and potential failure mode analysis, provided the following recommendations for safe dam operation and compliance with FERC regulations:

R-1: Spillway operation in 2017 resulted in increased erosion in the spillway plunge pool. Temporary measures during the spill event were taken, which included dumping large diameter riprap to slow erosion progression. Spillway releases during 2017 were a small fraction of spillway design capacity. Advanced hydraulic modeling is recommended to develop alternatives to stabilize the spillway plunge pool area and contain releases in a non-erosive manner.

R-2: Conduct geotechnical investigations to determine whether the dam is subject to liquefaction during a large earthquake event.

- R-3:** Conduct an updated seismic analysis with updated material properties based on results of the geotechnical investigation, to include in-site alluvial materials under the dam shells.
- R-4:** Determine effectiveness of spillway slab horizontal joint waterstop at active weeping on right side of spillway, just upstream of the flip bucket.
- R-5:** Develop means of inspecting and cleaning spillway drains in the original construction of the upper spillway.
- R-6:** Conduct a drilling/coring investigation in the spillway, per the 2018 Spillway Condition Assessment Report, including adjacent to the right side of the High-Level Outlet tunnel, to verify if voids are present.
- R-7:** Add visual monitoring for downstream boils to the dam inspection checklist.
- R-8:** Add visual monitoring for seepage at the left downstream abutment near the spillway plunge pool to the dam inspection checklist.
- R-9:** Add visual monitoring for the condition of the debris booms to the dam inspection checklist.
- R-10:** Add monuments and annual surveying of the upstream bench (El. 723) and downstream bench roads (El. 775 and El. 685).
- R-11:** Install piezometers and observation wells in the downstream dam shell and toe and begin monitoring phreatic surfaces.
- R-12:** Update the Dam Safety Surveillance and Monitoring Plan for Nacimiento Dam.
- R-13:** Evaluate and document noted over steepened riprap and thin spot of slope protection on the dam upstream slope.
- R-14:** Evaluate the extent of hollowness noted below the steel plating in the right chamber of the High-Level Outlet.
- R-15:** Clear, and repair if needed, the plugged south spillway crest drain.
- R-16:** Treat minor corrosion noted on exposed metal of the spillway crest gates.
- R-17:** Increase field staff for dam maintenance work and during high flow spillway operations. The increased manpower at Nacimiento will allow regular maintenance to be completed quickly and efficiently. This recommendation is supported by MCWRA engineering and maintenance staff.
- R-18:** Project construction history presented in Section 3 of the STID needs to be updated with projects completed since 2014.
- R-19:** Project standard operating procedures in Section 4 of the STID needs to be updated to reflect current operations.
- R-20:** Project geology above the powerhouse in Section 5 of the STID needs to be developed. The geology of the slope above the powerhouse should be re-evaluated by a qualified engineering geologist.
- R-21:** Detail of project hydrology and hydraulics in Section 6 of the STID needs to be developed further.
- R-22:** The stability and stress analyses of project structures in Section 8 of the STID include the 2008 Obermeyer Hydro, Inc. design calculations for the spillway gate. Text should be further developed for this section.
- R-23:** An updated seismic analysis should be completed for the embankment.
- R-24:** The discussion of the spillway crest gates in Section 9 of the STID needs to be further developed.
- R-25:** Project correspondence in Section 10 of the STID needs to be organized and updated with current correspondence and inspection reports.
- R-26:** The list of Project references included in Section 11 of the STID needs to include documents

used to update the STID.

MCWRA staff will develop a plan and schedule to address each recommendation.

The Nacimiento Dam 7th FERC Part 12D safety inspection report is not publicly distributed as it is considered Critical Energy Infrastructure Information (CEII) under FERC regulations, initially issued as a result of the September 11, 2001 attacks to protect critical infrastructure details. FERC CEII regulations may be found at <https://www.ferc.gov/legal/maj-ord-reg/land-docs/ceii-rule.asp>.

FINANCING:

N/A

OTHER AGENCY INVOLVEMENT:

The Nacimiento Dam 7th Part 12D report was sent to FERC for review on April 26, 2019, and to DSOD for review on May 21, 2019.

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