
State of California
The Resources Agency
Department of Water Resources

DRAFT
**REPORT ON EVALUATION OF POTENTIAL
GENERATION IMPROVEMENTS
(STUDY PLAN E-3)**

**Oroville Division, State Water Facilities
FERC Project No. 2100**



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EXECUTIVE SUMMARY

The Oroville Facilities operate under a license issued by the Federal Energy Regulatory Commission (FERC) as Project No. 2100 on February 11, 1957, for a term of 50 years. The license for the facilities will expire on January 31, 2007. Under requirements of the Federal Power Act (FPA) and FERC regulations, the licensee is required to file an application for a new license (relicense) on or before January 31, 2005.

After consulting with resource agencies, Indian Tribes, local organizations, nongovernmental organizations (NGO), and the public, the licensee (Department of Water Resources) requested and received approval from FERC to use Alternative Licensing Procedures (ALP) for relicensing the Oroville Facilities, as allowed under FERC's Final Rule issued on October 29, 1997 (Docket No. RM 95-116-000; Order No. 596). ALP is intended to expedite the licensing process by combining pre-filing consultation and federal and State environmental review processes into a single process, and to improve and facilitate communications among participants in the licensing process. This ALP will combine requirements of FPA, FERC regulations, the National Environmental Policy Act (NEPA), and the California Environmental Quality Act (CEQA), and will comply with State and federal resource agencies' approval and permitting processes.

In order to identify issues, plan studies, and consider potential protection, mitigation, and enhancement (PM&E) measures, a Collaborative Team, including the licensee, State and federal agencies, Indian Tribes, local government officials, and interested members of the public, are actively participating in the relicensing process. This Collaborative Team has been working together for over two years and has adopted a Process Protocol that sets forth the structure and procedures for ALP. It is available for viewing at www.orovillereicensing.water.ca.gov. During relicensing, the FPA requires FERC to consider "the plans and abilities of the applicant to operate and maintain the project in a manner most likely to provide efficient and reliable electric service." FERC licensing guidelines indicate that engineering studies for relicensing should include analyses of: 1) Project Operations; 2) Safety and Condition of Facilities and Equipment; and 3) Economics. The information to be gathered in these studies helps an applicant make a decision as to whether or not to propose project modifications, including generation improvements, in its license application.

This report on Evaluation of Potential Generation Improvements resulted in Engineering and Operations Work Group participants' desire to explore the potential for developing additional generation capacity through hydropower improvements or construction additions to the Oroville Facilities. The report documents the studies conducted by DWR under Study Plan E-3 to provide information on the issue of cost-efficient development of hydropower improvements or additions to the Oroville Facilities, in support of relicensing. Study Plan E-3 explores the overall power potential of the Oroville Facilities in light of current technology, regulatory requirements, water delivery requirements, and expected future power market conditions. The overriding premise has been to evaluate potential environmentally acceptable improvements that would not adversely affect the primary purpose of the Oroville Facilities, which is water supply.

The report does not identify any preferred option, but rather presents possible design concepts for each potential new project, and provides a discussion of major issues, fatal flaws, benefits, and costs for each option. Results have been provided to DWR senior management to enable them to factor them into the FERC relicensing process and to help them determine if any of the options studied would be reasonable to include with the FERC application for relicensing. Results of these studies will also permit the environmental resource study teams to address technical and environmental aspects of potential power improvements that could be proposed, and included with DWR's application for a new license. The study results are summarized in the following table:

Improvement Option	Installed MW / Avg. Energy (MWh)	Environmental Issues	Capital Costs	B/C Ratio
Hyatt Pumping-Generating Plant Modernization	645 MW (Existing)	None	Not estimated/modernization program underway	N/A
Sutter Butte Canal Outlet small hydro plant-conventional turbine option	2.4 / 7,823	Minor	\$8,953,000	0.69
Sutter Butte Canal Outlet-Hydromatrix™ option	1.2 / 4,411	Minor	\$3,785,000	0.82
Palermo Canal Outlet Small Hydro Plant	0.5 / 1,604	Minor	\$2,906,000	0.45
Hyatt Powerplant – Operations During Floods	N/A	None	Not estimated	N/A
Oroville-Thermalito Power Complex-Phase II	1,015 / 180,000	Significant	\$1,719,263	0.54 **
Thermalito Pumping-Generating Pplant-Feasibility of Refurbishment of Unit 1	32 / 400	None	\$7,064,000	0.05
Thermalito Pumping-Generating Plant-Evaluation of Potential to Convert Units 2, 3, & 4 to Variable Speed	85 / 13,397	None	Not estimated	N/A EIRR = 5.47%
Thermalito Afterbay River Outlet Small Hydro Plant	2.16 / 9,051	Minor	\$6,534,000	1.10
Kinetic Energy of Water Flowing in Thermalito Power Canal	N/A	Minor	Not estimated	N/A
Additional Hydropower Generation at Thermalito Diversion Dam	5.0 / 7,554	Minor	\$22,788,000	0.21
Fish Barrier Dam Small Hydro Plant	0.5 / 4,129	Minor	\$7,404,000	0.45
Increased Spinning Reserves	N/A	None	Not estimated	N/A