

California Energy Commission Agricultural Peak Load Reduction Program

For Water Agencies

Administered by the Irrigation Training and Research Center



Case Study

Orange Cove ID

Site

The Orange Cove Irrigation District is located in Fresno and Tulare Counties, approximately 30 miles southeast of Fresno and 20 miles north of the City of Visalia. The Friant-Kern Canal is the district's main source of water to supply 28,000 acres of farmland.

Opportunity

Portions of the Orange Cove Irrigation District (OCID) infrastructure lacked the necessary supervisory control and data acquisition (SCADA) system to allow the district and its water users to curtail peak load in those areas.

Solution

The district proposed and designed two projects that have curtailed over 763 kilowatts (kW) of peak load as part of the California Energy Commission Agricultural Peak Load Reduction Program (APLRP) for water agencies administered by the Irrigation Training and Research Center (ITRC). The first project included the addition of remote system monitoring, measurement, and control components, installed for sections of the water distribution system not currently equipped. The equipment provided the agency with the capability to monitor load, flow, and pumping efficiency in real time. In addition, Systems 3A & 8 were controlled to respond to critical water levels in their respective reservoirs. Critical alarms were also installed as part of the telemetry project. OCID reprogrammed the pump activation process so that the most efficient pumps would run the majority of the operational hours and the least efficient pumps would run the least.

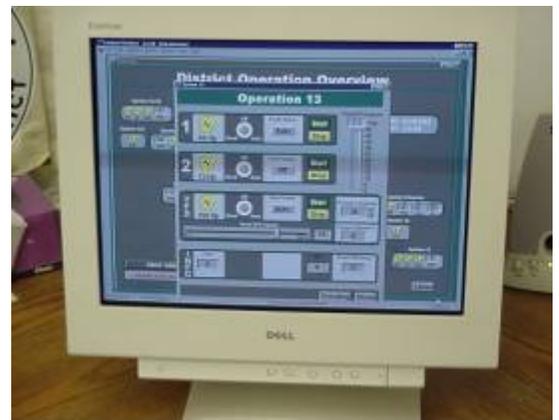


Figure 1. OCID SCADA screen in the district office.



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OCID also instituted a landowner load reduction program, whereby individual growers signed up with OCID to commit to a kW reduction during the peak period. In return, the district reduced the price of water for the growers.



Figure 2. Pump station discharge outlet with new flow meters (yellow).

The second project included equipping farmer-owned pumps with clock timers, flow control valves, and time-of-use meters to turn the pumps off before 12 pm and on after 6 pm. The project also included construction of a regulating reservoir and installation of telemetry equipment on the final portion of the district's pressurized infrastructure. The reservoir allows the district to store water during the off-peak period at the highest point in that portion of the

system. During the off peak period water from the reservoir is used so that pumping can be reduced. This project is considered Category 1 because installation of the regulating reservoir is the major cost in the project.

The first project was fully operational during the 2002 peak season (June-September) curtailing 637 kW of peak load (Monday-Friday, 12 pm-6 pm). This represents 510 kW of load reduction by the district and 127 kW of load reduction from water users in the district. The second project was completed prior to the 2003 peak season and curtailed an additional 126 kW of peak load, which represents 101 kW from the district and 26 kW from water users within the district.



Figure 3. Automatic valve on a farmer turnout to shutoff deliveries before 12 pm and turn them back on after 6 pm.



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Benefits

- The State of California has benefited from the curtailment of approximately 763 kW from the electricity grid during the summer peak period.
- OCID and its water users benefit from reduced power costs associated with reduced on-peak pumping both by the district and on-farm.
- With the installation of flow and load measurement on district pumps, the district now has the capability of monitoring pump efficiency on a real-time basis. This allows operators to run the most efficient pumps the most number of hours over a season, conserving electricity.

Summary Category	Results
Total Cost	\$383,334
Total Grant	\$211,575
Kilowatts (KW) Curtailed	763
Grant \$ per kW Curtailed	\$277.29

Further Information

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