

## VIII. MAJOR CONSTRUCTION AT PROJECTS

There are many construction projects at dams, pumping stations, diversion works, fish screens, and other facilities that all play their part in the management of the water resources of the Pacific Northwest. This chapter, by necessity, summarizes those construction projects that are associated with dams that have flood control, major power generation, irrigation supply, fisheries, or water supply, both Federally and non-Federally owned. It includes project construction for up rating of generators, repair of flood damages, and for safety of dams.

### A. FEDERAL PROJECTS

#### **1. Chief Joseph Pumping Plant**

Construction is underway to install fishscreen intake manifold for the pumping plant and an air burst cleaning system at Reclamation's East Unit River Pumping Plant of their Chief Joseph Project. The contract is for \$421,777 was awarded on September 1997 for intake fishscreen modifications.

#### **2. Ochoco Dam**

Reclamation is completing work required on the spillway modification contract for installation of a flow-meter, steel pipe, and electrical conduit, constructing inspection well and irrigation diversion structures, and repairing cracks in the stilling basin. This safety of dams contract was awarded on August 1997 for \$300,880.

#### **3. Salmon Lake Dam**

Construction has been completed by Reclamation on a test section of 44 stone columns at the downstream toe of Salmon Lake Dam in the Okanogan Basin that were installed to investigate the effectiveness of stone columns as a ground improvement method for liquefaction remediation and treatment design by comparing foundation strengths before and after stone column installation.

This safety of dams contract for the test section was awarded on June 1997 for \$388,634.

#### **4. McKay Dam**

Construction, by Reclamation, to place a filter and drain system and install a toe drain and outfall system at the downstream base of the dam, and to install instrumentation on the upstream face of the dam, is approximately 50% complete. This contract for \$1,159,334 was awarded on August 1997.

#### **5. Mud Mountain Dam**

The final phase of the reconstruction of Mud Mountain Dam has been completed and the final acceptance of the hydraulic gate operation for the new intake structure was signed in the fall of 1996. Since then several problems have arisen so some work continues. The warranty remains in effect through one year of trouble-free operation of the hydraulic gates.

### B. NON-FEDERAL PROJECTS

#### **1. Frog Lake Dam, Oak Grove Project**

Portland General Electric Company's (PGE) Frog Lake Dam is located in an area of ancient landslide terrain along the north side of the Clackamas River. A 70-foot-high, 2,200-foot-long embankment forms the west and north sides of the 530-acre-foot reservoir. The Frog Lake Slide (FLS) represents a reactivated portion of this terrain. The reactivated head scarp of the FLS, located between the inlet and outlet structures, was identified by divers in 1990. The FLS is about 3,000 feet wide, at least 250 feet deep, and extends about 5,000 feet downslope to the Clackamas River. In September 1996, PGE indicated that the reservoir would be reduced to about 144 af by constructing a cofferdam in an east-west direction across the reservoir, and proposed removing the western portion of Frog Lake Dam and constructing a new embankment

in its place. Final plans and specifications for the project were submitted by PGE March 28, 1997 letter. Construction was authorized and commenced on July 14, 1997, and was completed on November 10, 1997 at the cost of \$1,485,000.

## **2. Faraday Forebay, North Fork Project**

The 32.5-foot-high Faraday forebay embankment forms the 500 af forebay for the Faraday Powerhouse of PGE's project on the North Fork of the Clackamas River. The powerhouse was flooded in February 1996 and all five indoor generating units and auxiliary equipment inside the plant was damaged. Clean up work started immediately following the flood. PGE contracted with two private firms for the repair of the units including generator rewinding and rotor repair. Unit No. 4 was replaced and became operational on July 31, 1997. The other four units were placed on-line on November 26, 1996. The repair cost, including clean up work, was \$1,700,000.

## **3. Nisqually River**

The Nisqually River Project (Alder and La Grande dams), licensed to the City of Tacoma, is located in central part of western Washington, on the west slope of Mount Rainier, approximately 30 miles southwest of Tacoma, Washington. Alder Dam, a 285-foot-high arch structure, impounds Alder Lake, a 241.2 kaf reservoir. La Grande Dam, a 192-foot-high arch structure, impounds La Grande Lake, a 3,015 af reregulating reservoir. On February 8, 1996, a flood of record occurred (approximately 44,000 cfs), causing severe damage to the Alder spillway plunge pool and flooding the La Grande Powerhouse. The plunge pool is not structurally contiguous with the dam or spillway, and repairs primarily consisted of replacing the lost and eroded concrete. Many of the electrical facilities were damaged at the La Grande Powerhouse, including all five generators. The four older generators were rewound and placed back into service by September 1996 and the repairs of the fifth generator was completed on January 14, 1997. The cost was approximately \$1,600,000 for the powerhouse (lost generation not included), \$21,000 for road repair, and \$600,000 for the repair of Alder spillway plunge pool, for \$2,221,000.

## **4. South Fork Tolt River**

In January 1996 the City of Seattle completed the installation a new 16.8 MW powerplant at its existing Tolt water supply dam on the SF Tolt River. The exist-

ing project includes a 200-foot-high zoned earthfill dam, and an 882 af regulating basin with two saddle dams. A new contract to make seismic upgrades to the project included strengthening of the regulating basin's south dike and the main dam's intake and spillway tower, along with the access footbridge. The work to modify the intake and spillway tower structures is scheduled to be completed in May 1998 at an approximate cost of \$8.94 million.

## **5. McNary Dam**

Northern Wasco County People's Utility District (NWCPUD) was issued a license by September 30, 1991 Commission Order to construct a powerplant at the Army Corps of Engineer's McNary Dam, located at River Mile 292 on the Columbia River. The power project is located between the navigation lock and the project spillway, on the Auxiliary Water Supply System to the Washington Shore Fishway of McNary Dam. The project includes an intake structure with water supply conduits; a powerhouse with a single vertical turbine-generator rated at 9.69 MW; a turbine bypass facility; a diffuser water supply pool; horizontal weir/orifice flow control facilities for providing water to the diffusion chambers; about 1800 ft of transmission lines; and electrical interconnections. The proposed turbine/ generator installation will use the existing auxiliary water supply conduits and distribute flow from the turbine discharge to the diffusers, and then to the fishway. An April 2, 1996 FERC Order approved transfer of the license to include Public Utility District No. 1 of Klickitat County as co-licensee with NWCPUD. The project was completed in September 1997 and commercial on-line generation began November 3. Total cost was approximately \$26,390,000.

## **6. Rocky Reach Dam**

The Rocky Reach Project, licensed to Chelan County PUD No. 1 (Chelan), is located on the Columbia River in central Washington, seven miles north of the town of Wenatchee. The dam, completed in 1962, consists of concrete gravity, spillway, and powerhouse sections which contains 11 generating units with a total capacity of 1,249 MW. To reduce turbine cavitation and decrease fish mortality, Chelan recently initiated a turbine replacement program. This program will cost approximately \$67 million and is scheduled to be completed in 2001. To date the replacement of Unit Nos. 4, 5, and 7 has been completed, and Unit No. 6 turbine runner installation has been completed.