

Glossary of Terms

Flowage - The water impounded by a dam to be used to generate power. Flowages can be operated to improve flood control.

Reservoir - Water held in storage for future use. Wisconsin Valley Improvement Company has several reservoirs which are filled during high river flows and then used to supplement the river during low flow periods.

Pond - Jargon for both of the above impoundments. Size of the body of water varies. For instance, the Petenwell "pond" is 23,000 acres, WRIV is 40.

Head - Water level upstream or above the dam.

Tail - Water level downstream or below the dam.

Net Head - In its simplest terms, this is the difference between the head and tail elevation levels. This can vary throughout a given day. The headwater usually remains quite constant, but the tailwater will vary depending on flow.

Average net head - Figure for a 24 hour period of recording. This figure is used to calculate an average flow for the day at any hydro plant or dam.

Turbine - The portion of a hydro unit that changes the energy in the moving water to rotating mechanical energy to drive the alternator or generator. All CWPCo and WRPCo turbines are *reaction* turbines.

Runner - Term used interchangeably with water wheel. The weight of the water flowing through the turbine spins the runner. The runner is directly coupled to the generator. Three types of runners are used in our turbines. The Francis, in which water flows in from the side, passes through buckets and exits the bottom; the propeller which looks like a screw on a ship and the adjustable pitch propeller.

Generator - The portion of the hydro unit that converts the rotating mechanical energy into low voltage electrical energy. Generators for CWPCo and WRPCo generate power from 2,400 to 6,900 volts. This voltage is stepped up to 46,000, 69,000 or 138,000 volts depending on the design of the connecting transmission system.

Transformer - Device containing at least two sets of windings, or wires wrapped around a core. The purpose is to change any particular voltage level up or down, depending on the purpose it will be used for. Transformers typically operate in the 96 - 98% efficiency range. Most CWPCo and WRPCo power transformers are insulated and cooled with oil.

Gate - In dams throughout the midwest, three types of gates are commonly used. Sector gates, (taintor) are built in a semi-circle shape. The pressure against these gates is equalized during operation due to the shape. Sluice gates are like a knife valve, consisting of a flat gate moving up or down in a slide. The third is the vane or wicket gate used on the hydro turbine. Several of these gates are set around the water wheel and move in unison. This keeps the water pressure and flow constant around the water wheel as it flows through the gates and "pushes" the water wheel around.

Grid - Term used to refer the high voltage electrical system that connects generating stations and users together. Actual voltage levels vary, CWPCo uses mainly 46,000 volts on the transmission grid that connects all the mills. Petenwell is connected to a 138,000 volt transmission line.

Substation - Sometimes referred to a switchyard, the substation contains the transformers, switches and equipment to change the voltage levels and control the lines coming into the generating plant or mill. The substation also contains metering and relaying equipment to measure power and protect the equipment.

Project - Term to reference the entities licensed or controlled by the FERC. As in; project lands, project dikes, etc. Certain mill portions of the dams are non-project.

USGS - United States Geological Survey. All elevations used today are USGS mean sea level for consistency. Years back, each dam had its own elevation gauging based on the original benchmark when the dam was built.

FERC - Federal Energy Regulatory Commission. The FERC issues all licenses for CWPCo and WRPCo hydro facilities. FERC also is the regulatory body controlling wholesale transmission of energy.

PSCW - Public Service Commission of Wisconsin. The PSCW is the regulatory body protecting the interests of the retail customers; eg. home owners and small businesses.