

BEFORE THE FEDERAL POWER COMMISSION

EXHIBIT M-1  
POWER PLANT EQUIPMENT

ANCHORAGE LIGHT AND POWER COMPANY  
APPLICATION FOR AMENDMENT OF LICENSE  
PROJECT NO. 350 - ALASKA

In 1935, to increase the generating capacity of the Power Plant to meet increasing load requirements, a second 1500 horsepower turbine and a second 1250 KVA generator were installed in the west end of the original building on foundations constructed at the time the building was erected in 1929. The turbine and generator are a duplicate of the turbine and generator installation made in the original plant in 1929.

NO. 2 TURBINE

The turbine furnished by the Felton Water Wheel Company is of the reaction type, with horizontal shaft, single runner, and single discharge. It is of 1500 H.P. capacity and is the same as the No. 1 turbine installed in 1929. It is designed to operate at a speed of 720 r.p.m. under an effective head varying from 220 to 232 feet. Maximum efficiency is obtained at an effective head of 222 feet and is guaranteed to be not less than 83 percent. The turbine runner is of bronze and the shaft of high grade forged steel. On the generator end, a 7,000 pound fly wheel is provided to supply the necessary inertia to produce, in combination with the inertia of the generator rotor, the required speed regulation under changes of load. The unit has one main bearing and one outboard bearing, the latter provided with a double acting, water cooled thrust bearing of

the Kingsbury type, of ample capacity to carry the maximum possible unbalanced thrust in either direction which may be imposed by the water wheel.

For speed control there is provided a standard Pelton Oil pressure type 0-5 hydraulic governor of ample capacity for the required duty. This governor is of the self contained type, having enclosed centrifugal element, self-contained oil sump, pressure tank, motor driven gear oil pump, automatic unloading valve, emergency shutdown device, mechanical self-locking hand control mechanism and all necessary adjustments for complete control of the turbine.

For the protection of the penstock and to aid in close speed regulation under all load conditions, a Pelton governor operated relief valve is provided. This relief valve has an adjustable dashpot mechanism by means of which it can be made to act either as a water economizing device, or as a synchronous bypass. The relief valve has sufficient capacity to discharge the full flow of water required by the turbine when operating at full load - 72.5 C.F.S.

A 36 inch diameter branch pipe from the originally installed penstock wye, connects the turbine to the original penstock, which was designed for capacity sufficient for two units.

#### NO. 2 GENERATOR

The generator, furnished by the General Electric Company, is Type ATB-1250 KVA, Form HL, 3 phase, 60 cycle, 2300 volts, to run at a speed of 720 r.p.m. It is provided with a 21 K.W., 125 volt direct connected exciter and necessary rheostat. It is designed to withstand a maximum run-away speed of 1300 r.p.m. under no load conditions.

SWITCHBOARD FOR NO. 2 UNIT

Six new switchboard panels, furnished by the General Electric Company, were added to the original switchboard. These are of black composition and pipe supported. Viewing these new panels from the front and numbering them from left to right, they are as follows:

1. Camp Feeder mounting circuit breaker, ammeter, watt-hour meter, breaker tripping relays, ammeter transfer-jack receptacle, and watt-hour meter.
4. Total Meters mounting a graphic voltmeter, a graphic watt-hour meter and a watt-hour meter.
5. No. 2 Generator mounting ammeter, wattmeter, voltmeter, power factor meter, ammeter transfer-jack receptacle, voltmeter transfer-jack receptacle, synchronizing-plug receptacle, governor control switch, circuit breaker, disconnect and test terminals and links.
7. No. 2 Exciter mounting generator-field circuit breaker, field ammeter, field voltmeter, generator and exciter field rheostat hand wheels, voltage limiting rheostat, exciter to D.C. bus switch.
8. No. 1 Exciter, a new panel for No. 1 exciter was installed. This is a duplicate of No. 2 Exciter switchboard panel (No. 7 above).
9. Automatic Equipment, a new panel for automatic protection devices added since original installation.

POWER HOUSE SUB-STATION

For transforming the output of the two generators from the generator voltage of 2300 volts to transmission line voltage of 33,000 volts, a set of three Type H, 60 cycle, 833 KVA, 34,500/2300 volt transformers were installed in 1935 on a concrete foundation near the northwest corner of the power house. A steel superstructure over them, supports the switches and lightning arresters.

The three 400 KVA, 33,000/2300 volt transformers originally installed at the power plant for No. 1 Unit, were moved to the Anchorage sub-station and used in connection with the three 400 KVA, 33,000/2300 volt transformers installed there in 1929.

No increase in transmission line capacity was necessary as the original construction contemplated the output of the two units at the power plant.

#### TELEPHONE LINE AND ROAD

During 1941 a telephone line and road were constructed between the power plant and the Eklutna Storage Dam, a distance of 8.5 miles. The telephone line and road were made necessary by the requirement of a more close regulation of stored water from Eklutna Lake to accommodate the operation of the plant at more nearly its full capacity. The road was constructed to facilitate the Eklutna Storage Dam construction and also to give better access to the storage dam for operation of the outlet gates. Formerly there was only a trail between the power plant and the storage dam. A public highway from Anchorage to Matanuska Valley has made automobile travel possible between Anchorage and the power plant. Patrolling of the transmission line has been facilitated.

Access to the lake is now possible by automobile via the new road from the power plant to the lake.

The road is graded mostly in sidehill location and has been given a gravel surfacing, using the local gravel available. The road is 8 feet wide with widened turns and passing places.

The telephone line is constructed along the road and mostly on local spruce poles spaced about 150 feet. Some spans are supported by the standing trees. The circuit consists of two No. 9 galvanized iron wires supported on glass insulators on hardwood brackets.

The instrument at the lake is located in the cabin used for shelter and storage of supplies. The instrument at the power plant is located at the operator's office.

The Army has now taken over the road, telephone line and patrol of the area and it is not possible to make surveys at this time to determine their location with reference to the project boundary. This land is also unsurveyed.

This exhibit is a part of the application for amendment of license made by Anchorage Light and Power Company by ~~C. W. Jasper, Jr., its Vice-~~<sup>FF Reed</sup> President, and made in accordance with the Federal Power Commission's letters dated June 19 and October 21, 1942.

This description, Exhibit M-1, is a part of the application for an amendment of license for project No. 350, made by the undersigned this 26th day of October, 1943.

ANCHORAGE LIGHT AND POWER COMPANY

By

F. J. Reed

Vice-President



