LOWER AMERICAN FORK PLANT Location and plan of development. Near the mouth of American Fork canyon, 5 miles northeast of the town of American Fork, in Utah County, Utah. Diversion dam in sec. 28, T. 4 S., R. 2 ,E., Salt Lake base and meridian; pipeline along bottom of canyon and north side of creek to powerhouse in sec. 32.

Ownership and market: Owner, Utah Power & Light Co. Market, territory in Utah and southeastern Idaho served by Utah Power & Light Co. (See old Grace plant, p. 67.)

Chronologic summary. Construction began in December 1899, and was completed in December 1900. A second penstock added later. In 1912 one of these replaced by 3-ft. penstock and larger generator unit installed. Plant built by Utah County Light & Power Co. Acquired by Utah Power & Light Co. in 1913.

Water supply. Source of water, American Fork. Rights acquired by appropriation and use. Estimated Q90 flow 21 sec.-ft., Q50 flow 37 sec.-ft.; corresponding power capacities 490 and 860 hp., respectively.

Hydraulic features. Dam, timber, 14 in. by 14 in. by 25 ft. 5 in., embedded in concrete; crest height adjustable with flashboards. Intake: screened wooden flume 150 ft. long controlled by two wooden head gates, spillway over portions of flume into creek. Conduit: wooden-stave pipeline, first 2,987 ft. laid along bottom of canyon in many places in creek bed. Remaining 5,146 ft. along north hill slope on uniform grade of 10 ft. to a mile; diameter 3 ft. Two penstocks, length 325 ft., one 3 ft. in diameter, the other 2 ft. in diameter.

Powerhouse and transmission system: Powerhouse, brick on concrete foundations; dimensions 25 by 50 by 16 ft. Two-ton chain block for handling machinery. Installation, one 400-hp. 3-ft. 450-r. p. m. Cazin impulse water wheel direct-connected to one 250-kva. 6,600-v. 60-cycle General Electric generator. One 1,050-hp. 720-r. p. m. Allis-Chalmers horizontal turbine direct connected to one 700-kva. 6,600-v. 60-cycle General Electric generator. One 6.5-kw. 125-v. 950-r. p. m. belt-driven General Electric exciter generator and one 20-kw. 125-v. 720-r. p. m. General Electric generator direct-connected to main generator shaft. Impulse water wheel when operating with full generator load (250 kw.) under head of 275 ft. requires 20 sec.-ft. of water. Turbine designed for head of 252 ft. Operating head at plant 255 ft., static head 292 ft. Turbine requires 39 sec.-ft. of water under head of 287 ft. and 700-kw. generator head. Current leaves plant at 44,000 and 6,600 v. and is distributed over system of Utah Power & Light Co.

Remarks. Plant built to furnish light and power to towns of Lehi, American Fork, and Pleasant Grove, in Utah County, Utah.

UPPER AMERICAN FORK PIANT Location and plan of development. In lower part of American Fork canyon 6 miles northeast of American Fork, Utah County, Utah. Diversion dam in sec. 25, T. 4 S., R. 2 E., Salt Lake base and meridian; pipeline along north side of canyon to powerhouse in sec. 28.

Ownership and market. Owner, Utah Power & Light Co. Market, territory in Utah and southeastern Idaho served by Utah Power & Light Co. (See old Grace plant, p. 67.)

Chronologic summary. Construction work started in May 1906, and completed in November 1907. Plant built by Utah County Light & Power Co. Acquired by Utah Power & Light Co. in 1913.

Water supply. Source of water, American Fork. Rights acquired through State engineer of Utah. Amount claimed 50.04 sec.-ft. Estimated Q90 flow 17 sec.-ft., Q50 flow 29 sec.-ft.; corresponding power capacities 780 and 1,330 hp., respectively.

Hydraulic features. Dam, originally small wooden structure, replaced in 1914 by concrete and steel dam. Earth dike extends 50 ft. beyond south end. Total crest length, including dikes, approximately 108 ft. Maximum height 12 ft.; 4-ft. fish ladder at south end; 29f-ft. spillway with flashboards 6 ft. high; 6-ft. sluiceway controlled by hand-operated gate. Intake, concrete flume section 6 ft. wide with screens, controlled by Taintor gate operated by means of 2-ton Yale &

Towne duplex chain block; length of intake flume 48 ft. Conduit, wooden-stave pipe, crossing from south side of creek to north side at point 1,250 ft. below dam. Length 11,750 ft., diameter 30 in. Course, rough and broken. Three inverted siphons in the line. Maximum head at one of them 175 ft. Two trestles; 11 tunnels through solid rock varying in length from 25 to 160 ft. Penstock, steel pipe, length 547 ft., diameter 36 in. at top and 33 in. at bottom. Steel Y, each leg 30 in. in diameter, at lower end of penstock.

Powerhouse and transmission system. Powerhouse, brick with concrete floor and foundations, inside dimensions 35 by 68 by 20 ft., with extension 20 by 39 by 20 ft. A 12-ton 30-ft. span hand-operated Whiting crane serves main part of building. Installation, two 1,000-hp. 300-r.p.m. Pelton water wheels direct connected to two 600-kva. 6,600-v. 3-phase 60-cycle Westinghouse generators. Two 35-kw. 125-v. 280-a. 725-rip.m. Westinghouse exciter generators belt driven from main shafts. Water wheels designed for 520-ft. head. Operating head at plant 525 ft., static head 575 ft. With generator load of 600 kw. and operating head of 525 ft. each wheel uses 22.5 sec.-ft. of water. Current leaves plant at 44,000 and 6,600 v. and is distributed over general system of Utah Power & Light Co.