

June 9, 2020

VIA ELECTRONIC FILING

Project No. 349-207
Martin Dam Project
Order Amending License to Replace Turbine Runner

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Dear Ms. Bose:

Alabama Power Company (Alabama Power) is the Federal Energy Regulatory Commission (FERC or Commission) licensee for the Martin Dam Project (FERC No. 349)¹. On December 17, 2019, Alabama Power filed an Application for a Non-Capacity Related Amendment of License² for the purpose of conducting a turbine upgrade for Unit 4 of the Martin Dam Project. On May 12, 2020, FERC issued an Order Amending License To Replace Turbine Runner³. Paragraphs C and E of the May 12th order require:

- (C) Within 30 days of the issuance date of this order, the licensee must inform the Commission of the date on which it commenced the generator rewind at unit no. 4 which raised the capacity of the generator from 55.2 to 66.24 megawatts.
- (E) Within 30 days of the issuance date of this order, the licensee must file, for Commission approval, a revised Exhibit A including a description of the new runner and related equipment, and accurately describing the capacity of the new turbine.

Martin Unit 4 Generator Rewind

Alabama Power commenced the generator rewind on Martin Unit 4 on May 4, 2015.

Revisions to Exhibit A

Paragraph E of the May 12, 2020 order requires Alabama Power to file a revised Exhibit A. Therefore, attached hereto is Exhibit A for the Martin Dam Project (Revised June 2020).

¹ 153 FERC ¶ 61,298

² Accession Number 20191217-5113

³ 171 FERC ¶ 62,082

If there are any questions concerning this filing, please contact me at tmills@southernco.com or 205-257-4892.

Sincerely,

A handwritten signature in blue ink that reads "Tina L Mills". The signature is written in a cursive style with a horizontal line underneath the name.

Tina L Mills
Hydro Licensing Specialist

Attachment (1)

Attachment

Revised (June 2020) Exhibit A

EXHIBIT A
PROJECT DESCRIPTION

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**MARTIN DAM PROJECT
FERC No. 349**

ALABAMA POWER COMPANY

**EXHIBIT A
JUNE 2020**

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PROJECT DESCRIPTION

**MARTIN DAM PROJECT
FERC No. 349**

ALABAMA POWER COMPANY

EXHIBIT A

1.0 INTRODUCTION

The Martin Dam Project (Project) is comprised of an existing, licensed major hydroelectric facility owned and operated by Alabama Power Company (Alabama Power or Licensee), a wholly owned subsidiary of Southern Company. The Project is comprised of a dam, spillway, powerhouse, 41,150 acre reservoir, and approximately 8,602 acres of additional Project lands, known collectively as “Lake Martin.” Lake Martin is located in east central Alabama on the Tallapoosa River, near Alexander City and Dadeville, Alabama.

The original 50-year project license was issued by the Federal Power Commission (FPC) to the Alabama Interstate Power Company on June 9, 1923, and two weeks later, on June 22, 1923, the FPC issued an order transferring the License to Alabama Power. On May 11, 1978, the Federal Energy Regulatory Commission (FERC) issued a second license for the Project, and on December 17, 2015, FERC issued its current license.

2.0 MARTIN DAM PROJECT

2.1 PROJECT STRUCTURES

The Project consists of a concrete gravity dam with an earth dike section, about 2,000 feet (ft) in length and with a maximum height of 168 ft. The dam contains a 720-foot long arched concrete gravity gated spillway with 20 vertical lift steel spillway gates measuring 30 ft wide by 16 ft high. The spillway gates are used to pass floodwaters in excess of turbine capacity. The deck elevation above the spillway is 501 ft mean sea level (msl).¹

There is a 255-foot concrete gravity non-overflow section on the right abutment, and an approximately 1,000-foot compacted homogeneous earth embankment on the east (left) abutment. Project headworks include a 280-foot concrete gravity intake structure with 12 intake gates (three per unit) measuring 9 ft wide by 24 ft high. Each intake is fitted with a trash rack and there are four steel penstocks.

The Project powerhouse is a brick, steel, and concrete structure standing 99 ft above the generator floor and is integral with the intake facilities. It houses four vertical flow units totaling 190.8² megawatts (MW). The building measures 307.9 ft long by 58 ft wide by 99 ft high. It contains an overhead crane with a capacity of 200 tons. The crane is used to perform maintenance on the units.

The Project intake structures' inverters are located 68 ft below normal full pool elevation. During the 2007 drought, Alabama Power asked the turbine manufacturer (General Electric) to investigate the minimum operational elevation at which water could be released through the newly refurbished turbines without causing damage to the equipment. It was determined that elevation 445.5 msl was the lowest elevation the Project could safely operate the turbines.

¹ In the 1920s, when land was being purchased for construction of the Project, a locally established reference point known as Martin Datum (MD) was used for determining elevations. Today, most figures, drawings, and general references are shown in mean sea level (msl), which FERC also uses as its standard. An elevation listed as "mean sea level" is equivalent to 1 foot greater than Martin Datum Elevation, which means that elevation 490 MD is equivalent to 491 msl.

² The new turbine installation scheduled in 2020-2021 for Martin Unit 4 is expected to provide approximately 5 MWs of additional capacity. The total authorized installed capacity of 190.8 MW assumes the authorized installed capacity following the upgrade completion for Martin Unit 4 is 63.5 MW.

2.2 RESERVOIR CHARACTERISTICS

The Martin reservoir, commonly referred to as Lake Martin, extends up the Tallapoosa River for approximately 31 miles with approximately 880 miles of shoreline. The Project has a drainage area of approximately 2,984 sq. mi. The reservoir surface area is about 41,150 acres at the normal full pool elevation of 491 ft msl and has a mandatory drawdown of 7 ft in the winter months. The normal tailwater elevation is 345 ft msl. The gross storage capacity of Lake Martin at maximum pool is 1.6 million acre-feet; active storage in the available 45.5 ft drawdown is 1.2 million acre-feet (elevation 445.5 msl).

2.3 TURBINES AND GENERATORS

The Martin Project powerhouse contains three General Electric vertical type Francis turbines (Units 1-3) and one American Hydro vertical type Francis turbine (Unit 4)³. Units 1, 2, and 3, installed in 1926, were upgraded between 2001 and 2004 and have turbine ratings of 45.8 MW, 41 MW, and 40.5 MW, respectively, and have generator ratings of 47.7 MW each. Unit 4, installed in 1952 with a generator rewind in 2015 and a turbine upgrade in 2020-2021, has a turbine rating of 63.5 MW and a generator rating of 66.24 MW.

Units 1, 2, and 3 are connected through a dedicated three phase 12/115 kilovolt step-up transformers rated at 55 kilovolt amperes (kva) each. Unit 4 is connected through a bank of three, single phase 12/115 kilovolt step-up transformers, rated 23,333 kva each. These transformers are located on the downstream side of the headworks, immediately behind the powerhouse, and are connected to a switching station located at the west end of the dam.

The 10-year average annual generation from the Project is about 301,096,000 kWh (Table A-1). In addition, Lake Martin contributes to the energy that is generated at Yates and Thurlow dams because of its ability to store and release water that would otherwise be spilled. Furthermore, because of Martin Dam's operational flexibility, it is able to store water during low electrical

³ The Martin Unit 4 turbine will be upgraded in 2020-2021. The Unit 4 turbine information contained herein is provided based upon the proposed scope of work, because the as built information is not available at the time of this filing.

usage periods and then generate with the same water during periods of high electrical use when production costs would normally be higher. This results in lower production costs to Alabama Power and a savings for its customers. All of the electric energy generated at the Project is used in the interconnected system of Alabama Power for public utility purposes.

TABLE A-1 MARTIN DAM PROJECT AVERAGE MONTHLY ACTUAL GENERATION FROM 2001 TO 2010

(Source: personal communication with Andy Sheppard, HOMS data, Alabama Power Company, 2011)

MONTH	KWH
January	31,120,000
February	24,627,000
March	27,480,000
April	21,709,000
May	27,474,000
June	21,849,000
July	21,402,000
August	16,192,000
September	19,300,000
October	21,175,000
November	32,646,000
December	36,122,000
YEAR	301,096,000

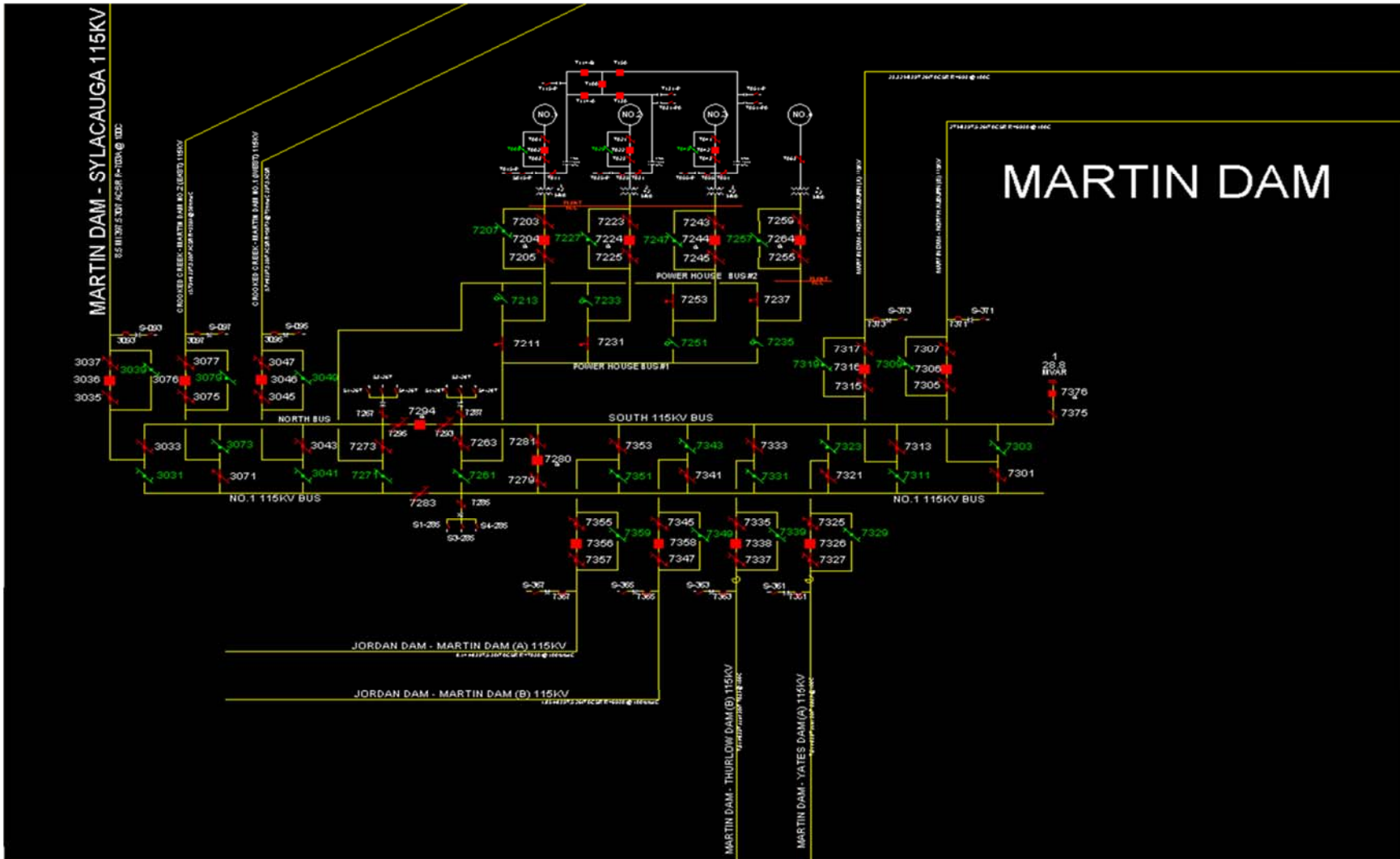
2.4 TRANSMISSION SYSTEM

The generating plant is connected into the integrated transmission system through nine 115-kilovolt transmission lines terminating at this switching station. The Project also includes two short (450-foot long) 115-kilovolt transmission lines and appurtenant facilities. Figure A-2 shows a single-line diagram of the transmission line arrangement at the Project.

2.5 LANDS OF THE UNITED STATES

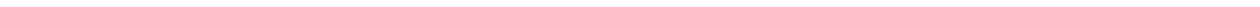
The Martin Dam Project boundary includes property owned and managed by the U.S. government. For fiscal year 2010, Alabama Power paid \$38.11 for the use of 1.36 acres (includes inundated and non-inundated) of Federal lands within the Project Boundary.

FIGURE A-1 MARTIN DAM PROJECT SINGLE-LINE DIAGRAM



APPENDIX 1

LIST OF STANDARD NUMBERS FOR THE MARTIN DAM PROJECT



DESCRIPTION	NUMBER OR FACT
GENERAL INFORMATION	
FERC Number	349
License Issued	December 17, 2015
License Expiration Date	November 30, 2045
Licensed Capacity	190.8 MW
Project Location	Near Town of Dadeville; Counties of Elmore and Tallapoosa; Tallapoosa River at River Mile 60.0
Relationship to Harris and Yates and Thurlow	78.5 miles below Harris Dam; Martin tailrace is 7.9 miles above Yates Dam; Thurlow Dam is located 10.9 miles below Martin
Total Area Encompassed by Existing Project Boundary (*land and water)	49,752 acres
Acres of Water Within Existing Project Boundary	41,150
Acres of Mainland Within Existing Project Boundary	Approximately 8602 acres
Martin Dam Drainage Basin	2,984 square miles
Length of River From Martin Dam	31 mi. from dam to headwaters
Federal lands within project boundary	1.36
DAM	
Date of Construction of Units 1, 2, and 3	July 24, 1923
In-Service Date of Units 1,2, and 3	December 31, 1926
Unit 4 Installed	July 15, 1952
Construction Type	Gravity concrete
Elevation Top of Abutments	507.5 ft msl
Gross Head at Normal Pool Elevation (491 msl)	146 ft
Spillway Height (to top of gates)	491 ft msl
Total Length of Water Retaining Structures	2,000 ft
Length of Abutments:	North-Right 255 ft South-Left 1,000 ft
Length of Powerhouse (substructure)	307.9 ft
Length of Spillway (total)	720 ft
Length of Spillway (gated)	720 ft
Gates:	Spillway Gates 20 total Width 30 ft Height, Maximum Opening 16 ft Crest Elevation 475 ft msl Capacity of Each Gate 6,700 cfs (alternate gates)
Hazard Classification	High
Spillway Capacity at 500 msl	297,500 cfs
Length of Impoundment	31 mi
Pool Elevations:	Maximum (not including parapet wall) 491 ft msl Normal (Full Summer) 491 ft msl Minimum 445.5 ft msl

DESCRIPTION		NUMBER OR FACT
Gross Storage:	Maximum Pool @ Elevation 491.0	1.6 million acre-ft
	Minimum Pool @ Elevation 445.5	0.4 million acre-ft
Active Storage Capacity		1.2 million acre-ft
Surface Area (at 491 msl)		40,000 acres
Number of Permits Issued (through April 2011)		Approximately 7200
Retention Time / Flushing Rate		194 days
Water Temperature Range:	Maximum	32.01 C Aug
	Minimum	6 C Jan-Feb
Existing Classification		Swimming/Fish and Wildlife; Public Water Supply
Area of Watershed		4,675 sq miles
POWERHOUSE		
Length (Superstructure)		307.9 ft
Width (Superstructure)		58 ft
Height		99 ft
Construction Type (Superstructure)		Brick and concrete, steel framed
Penstock Invert Elevation		423 ft msl
Operating Floor Elevation		435 ft msl
Gross Head		146 ft msl
Normal Tailwater Elevation		345 ft msl
High Tailwater Elevation		380 ft msl
Maximum Hydraulic Capacity		Approximately 18,200 cfs
Intake Openings:	Number of Openings	12
	Invert Elevation	423 ft msl
	Each Gate Opening	9 ft wide by 24 ft high
Outdoor Gantry Crane Capacity		200 tons
TURBINES		
Number		4
Rated Net Head		Units 1-3 143 Ft. Unit 4 145 Ft
Turbines	Manufacturer Type	#1, #2, #3 – G.E.
		#4 – American Hydro Francis
Rated Discharge Capacity:	Maximum	Unit 1 – 4,631 cfs Unit 2 – 3,951 cfs Unit 3 – 3,968 cfs Unit 4 – 5,616 cfs
	Minimum	Unit 1 – 4,024 cfs Unit 2 – 3,653cfs Unit 3 – 3,563cfs Unit 4 – 4,464 cfs
Speed		Units 1-3 120.0 rpm
		Unit 4 112.5 rpm

DESCRIPTION	NUMBER OR FACT
Diameter of water wheel	Unit 1 12.5 feet Units 2-3 12.1 feet Unit 4 15.0 feet
Rated Output	Unit 1 61,012 hp Unit 2 54,723 hp Unit 3 53,940 hp Unit 4 84,667 hp
GENERATORS	
Number	4
Nameplate Rating	Units 1-3 47,738 kW each Unit 4 66,240 kW
Power Factor	.95 (Units 1-3) .92 (Unit 4)
Voltage	12,000 volts
Number of Phases	Three single line phases
Frequency	60 Hz
Average Annual Generation (2001-2010)	301,096, 000 kWh
TRANSFORMERS	
Number	6
Transmission Voltage	Low side – 12,000 volts High side – 115,000 volts
Rating	Units 1-3; Dedicated 3 phase rated at 55,000 kva each Unit 4: 3 single-phase rated at 23,333 kva each
FLOOD FLOWS – MARTIN	
100 Year Flood – Flow	136,000 cfs (March 1990)
Probable Maximum Flood Elevation	508.3 ft msl
RELATIONSHIP TO OTHER TALLAPOOSA PROJECTS	
Harris	78.5 miles upstream
Yates	7.9 miles downstream
Thurlow	10.9 miles downstream