Flint Creek Power Plant

Reliable Electric Power for Northwest Arkansas



Arkansas Legislative Joint Energy Committee Dec. 17, 2013



Flint Creek Power Plant

- Coal-fueled
- 528 MW
- Serves base load
- Co-owners
 - AEP SWEPCO (50%)
 - Arkansas Electric Cooperative Corp. (AECC) (50%)
- Operated by SWEPCO
- In-service date: 1978
- Location: Gentry, Ark.





Harry D. Mattison Power Plant

- Natural gas, simple cycle combustion turbines
- 4 units, 300 MW total
- Serves peak load
- Owned by SWEPCO
- Operated by Flint Creek staff
- Completed on fast track in 2007 to meet NWA growth
- Location: Tontitown, Ark.





SWEPCO's Generation Fleet



Existing Plants

 Base Load, Intermediate and Peaking

New Plants

- Harry D. Mattison Plant
 - Tontitown, AR
 - 300 MW Natural Gas -- Peaking
 - Completed 2007
- John W. Turk Jr. Plant
 - Hempstead County, AR
 - 600 MW (440 SWEPCO) Coal – Base Load
 - Completed 2012
 - J. Lamar Stall Unit
 - Shreveport, LA
 - 509 MW Natural Gas Intermediate Load
 - Completed 2010

North American Electric Grid



SWEPCO Part of SPP

Independent System Operator (ISO) / Regional Transmission Organization (RTO) Map



Northwest Arkansas Grid





Flint Creek and the NWA Grid

- Flint Creek anchors the NW Arkansas electric grid
- Only base load plant located in NW Arkansas
 - Baseload plants supply power 24/7
- Located near load centers of Fayetteville, Springdale, Rogers, Bentonville
- Has powered regional growth for 30+ years
- Necessary to meet demand and reliability reserve requirements
 - Electric load in the region exceeds local power supply
 - NWA is already transmission-dependent (a net importer of electricity)



Base Load Power

- Base load is the basic demand for power that exists on the system around the clock
- Base load plants operate 24/7 to meet these daily needs

PEAK LOAD Operates to meet peak demand

INTERMEDIATE Operates as demand rises and falls

> BASE LOAD Operates 24/7



How A Power Plant Works

- Energy from fuels (fossil, nuclear, renewable) is converted into another form of energy (usually mechanical or heat)
- Energy turns fan-like blades inside a turbine (like blowing on a pinwheel)
- Turbine attached to a pole-like shaft in generator
- Causes wires inside a magnetic field in the generator to turn, starting a flow of electons out of the plant, into a transformer and then into transmission wires



Steam Power Generation





Coal at Flint Creek



- Low-sulfur coal Powder River Basin, Wyoming
- Arrives by rail and is stored in the plant's coal yard
- Conveyor belts carry the coal from the yard into the plant







Steam Turbine Generator



Turbine blades outside housing during maintenance outage.

- Pulverizers grind the coal into a fine, talcum powder-like consistency
- Powdered coal is injected into the boilers where it burns at high temperatures, turning water that circulates in the boilers into steam
- Steam turns turbine blades
- Turbine turns the generator



Natural Gas – Mattison Power Plant

- Natural gas arrives by pipeline
- In gas-fueled turbines, works similar to jet engine
 - Natural gas is ignited and burned
 - Heat creates pressure that turns the turbine
- In steam plants
 - Injected into boiler to heat water into steam
 - Steam turns turbine



SWEPCO's Harry Mattison Power Plant, Tontitown, Ark.



EPA Regulations Forced a Choice for Flint Creek

- Flint Creek Power Plant required to meet stringent air emissions limits to comply with new EPA regulations – or cease operations after April 2015
 - Mercury and Air Toxics Standard (MATS) reduction of mercury and other hazardous air pollutants. Required April 2016 (with one-year extension for installation under way)
 - Regional Haze Rule reduce pollution that impairs visibility to federal Class I areas (designated wilderness areas and national parks) – reduce SO2, NOx, and particulate matter. Required in 2017/2018



In the Public Interest

- APSC ruled in July 2013 that retrofit with additional environmental controls is in the public interest
- ADEQ granted one-year extension to April 2016
 - Can continue operations beyond EPA's 2015 deadline while controls are installed
- ADEQ issued air permit in November 2013, including authorization to construct and operate new pollution control equipment





Retrofit Benefits

- New technology will be added to a valuable existing asset
- Maintain critical reliability
- Meet stringent new environmental regulations
- Lowest reasonable cost impact to our customers
- Preserves/add jobs





Retrofit Benefits

- Preserves Flint Creek's existing 69 jobs, \$3.9 million payroll and \$1.2 million annual real estate/property taxes
- Preserves Flint Creeks total economic output of \$28.2 M for Washington and Benton Counties
- Up to 300 construction jobs at peak
- Up to 20-30 permanent jobs







Current Environmental Systems

- Low-sulfur fuel supply
- Low NOx burners control burning to reduce formation of nitrogen oxides
- Electrostatic precipitator removes more than 99% of fly ash (particulate) from the flue gas stream
- Continuous emission monitoring system (CEMS) to help ensure compliance with regulations





Retrofit Technology Summary

- Scrubber Dry Flue Gas Desulfurization (FGD) with pulse jet fabric filter (commonly called baghouse)
 - NID technology
 - Removes SO2 (95% or better)
 - Uses lime as reagent
 - Co-benefit of additional mercury, metals, acid gas removal
- Activated Carbon Injection (ACI)
 - Injects powdered activated carbon to remove mercury (approx. 90%)
- Low NOx burners and Overfire Air
 - Improves efficiency of fuel combustion to minimize NOx
- Landfill development, other work related to retrofit components



New Environmental Controls



This illustration is conceptual. Relationships in size and volume may not be accurately portrayed.





Time Line

- APSC approval July 2013
- ADEQ air permit issued November 2013
- Construction began November 2013
- 30-month construction schedule with equipment in operation by June 2016



Peach orchard in bloom - Spring 2013



Environmental Stewardship



- 500-acre SWEPCO Lake
- Eagle Watch Nature Trail
- Habitat management
- Public and community partnerships





G&F Boat Ramp, Fishing Pier



- Year-round warm water
- G&F stocks lake
- Ramp, pier remodeled, dedicated June 2008





Tree Farm at Flint Creek

- AEP Foundation grant to Illinois River Watershed Partnership
- Little Flint Creek and SWEPCO Lake part of Illinois River Watershed
- IRWP riparian project tree planting along streams
- Flint Creek growing trees for transplanting into riparian zones







Bald Eagles at SWEPCO Lake











Eagle Watch Nature Trail





- Built in 1999 by plant employees and Gentry Boy Scout Troop 34
- Located on SWEPCO Lake at Flint Creek Power Plant
- 1 mile west of Gentry, Ark.
- 65 acres
- Half-mile nature trail
- Wildlife viewing pavilion



Community Partnerships

- Community partnerships
 - Local schools
 - 4-H, FFA
 - Scouts
- Outdoor classroom
- Earth Day programs
- Open to the public yearround
 - Community groups
 - Bird watchers
 - Hikers
 - More than 10,000 visitors since 1999





Habitat Management



- Planting native grasses,
 wildflowers, trees, food plots
- Controlled burn to promote native prairie grass





100-Plus Bird Species









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A unit of American Electric Power

ELECTRIC POWER

Flint Creek Recognition

- Audubon Arkansas Important Bird Area (IBA)
- Wildlife Habitat Council
 - Corporate Lands for Learning
 - Wildlife at Work
 - Pollinator Protection Award
 - Community Partner of the Year Bloomfield 4-H
 - Signature Site of Sustainability
- Arkansas Wildlife Federation Arkansas Acres for Wildlife





Keep Up with Eagle Watch!



EAGLE WATCH NATURE TRAIL Become a fan on Facebook: <u>www.facebook.com/SWEPCOEagleWatch</u>



 Learn more at: <u>www.SWEPCO.com/environment</u>









Environmental Stewardship

 Flint Creek's reason for existence is producing electricity. But the SWEPCO plant's coexistence with the environment is the result of vision and hard work by dedicated employees and community partners. It's a leading example of SWEPCO's commitment to providing reliable, affordable electric power while actively working to protect people and the environment.



Our Safety Culture

- 17 years without a lost-time accident Oct. 12, 2013
- 2 million work hours without a lost-time accident July 11, 2012
 - No aspect of operations is more important than the health and safety of people. Our customers' needs are met in harmony with environmental protection.



Questions?



Eagle Watch Nature Trail at Flint Creek Power Plant

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