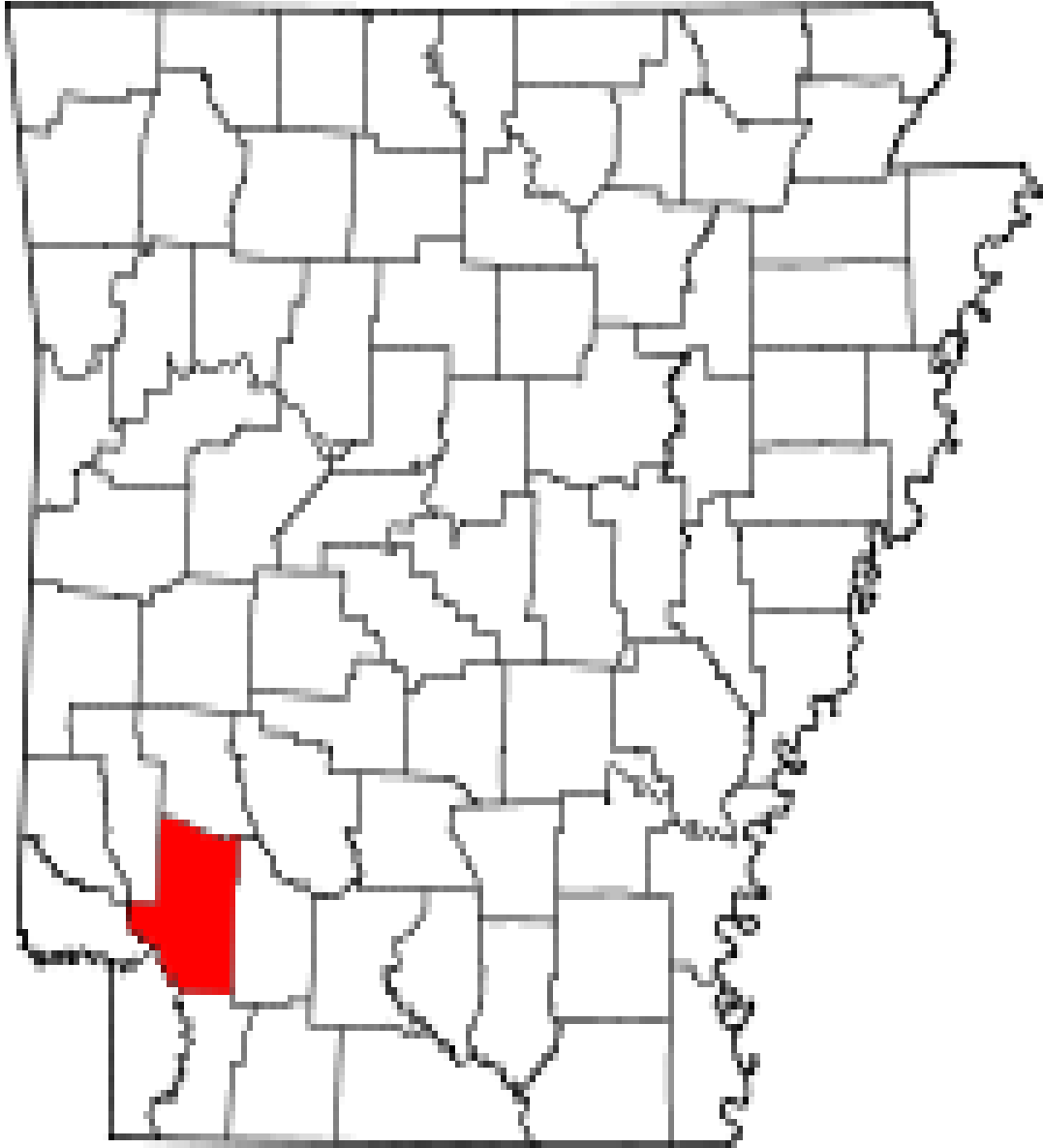


**John W. Turk, Jr. Power
Plant
2013 Power Plant of the Year**

**Craig Henry
Turk Maintenance Superintendent
AEP/SWEPCO**





Project Back Ground & Schedule

- Green field site at Fulton, AR 2800 acre site purchased from Weyerhaeuser (Cancelled Paper Mill site)
- Permitting process begin September 2006
- Plant management involved in all aspects of design engineering
- Site preparation work begin 07
- Project received boiler air permit allowing construction to start Nov 8, 2008 legal challenges held work until appeal released full construction Dec 8, 2008
- Start Boiler Building Steel Erection – Aug 24, 2009
- Start Boiler Construction – Jan 23, 2010
- Energized RAT/ started operational shift work - May 22, 2011

Project Back Ground & Schedule

- Start Boiler Hydro – Oct 29, 2011 (RH)
- Boiler Hydro Complete – Dec 14, 2011 (MS)
- Major Contract Change – July 16, 2012
- First Fire (Major construction complete - Aug 21, 2012
- MS Blows Complete – Sep 13, 2012 (566 total)
- RH Blows Complete – Sep 24, 2012 (270 total)
- First coal fire – Oct 27, 2012
- Generator Initial Synchronization – Nov 8, 2012
- Boiler once through (approx. 32% steam flow) – Nov 18, 2012
- Substantial Completion (COD) – Dec 20, 2012
- First Fire to COD Four Months (originally 9 month schedule)

Project Back Ground & Schedule

- Startup team made up of all crafts: Engineering, Construction, Commissioning, Plant Operations, Mechanical, Electrical, DCS, B&W Startup, Alstom, and Emerson (All supporting the needs of operations 24/7)
- All plant employees actively engaged in start up.

Plant Design Features

- Nominal 624 NMW net Ultra-Supercritical Pulverized PRB Coal Fired Plant – extended load 650 NMW
- Steam conditions 3515 psi 1115 °F MS 1125 °F RH
- Alstom four casing tandem-compound high efficiency turbine. Welded rotor design
- Babcock & Wilcox Steam Generator and AQCS
- SCR-anhydrous ammonia, no bypass
- Spray Dryer Absorber – pebble lime / recycle ash
- Pulse Jet Fabric filter
- FLSmith Activated carbon injection for mercury control

Plant Design Features

- Shaw / CBI Balance of plant, Piping, Coal systems, Cooling tower, buildings and structural steel. B&W Boiler and AQCS (over 300 contract handover points B&W / Shaw)
- 8 feedwater heater stages – HARP
- Flowserve boiler feed pumps - motor driven startup (30%)
Alstom turbine drives the main BFP
- Mechanical Cooling tower – 16 cell
- Turbine bypass system - 30% capacity
- Emerson Ovation DCS controls
- Emerson / GSE High Fidelity Simulator in service March 4, 2011
(Training, Procedures, Tuning parameters)

Steam Generator

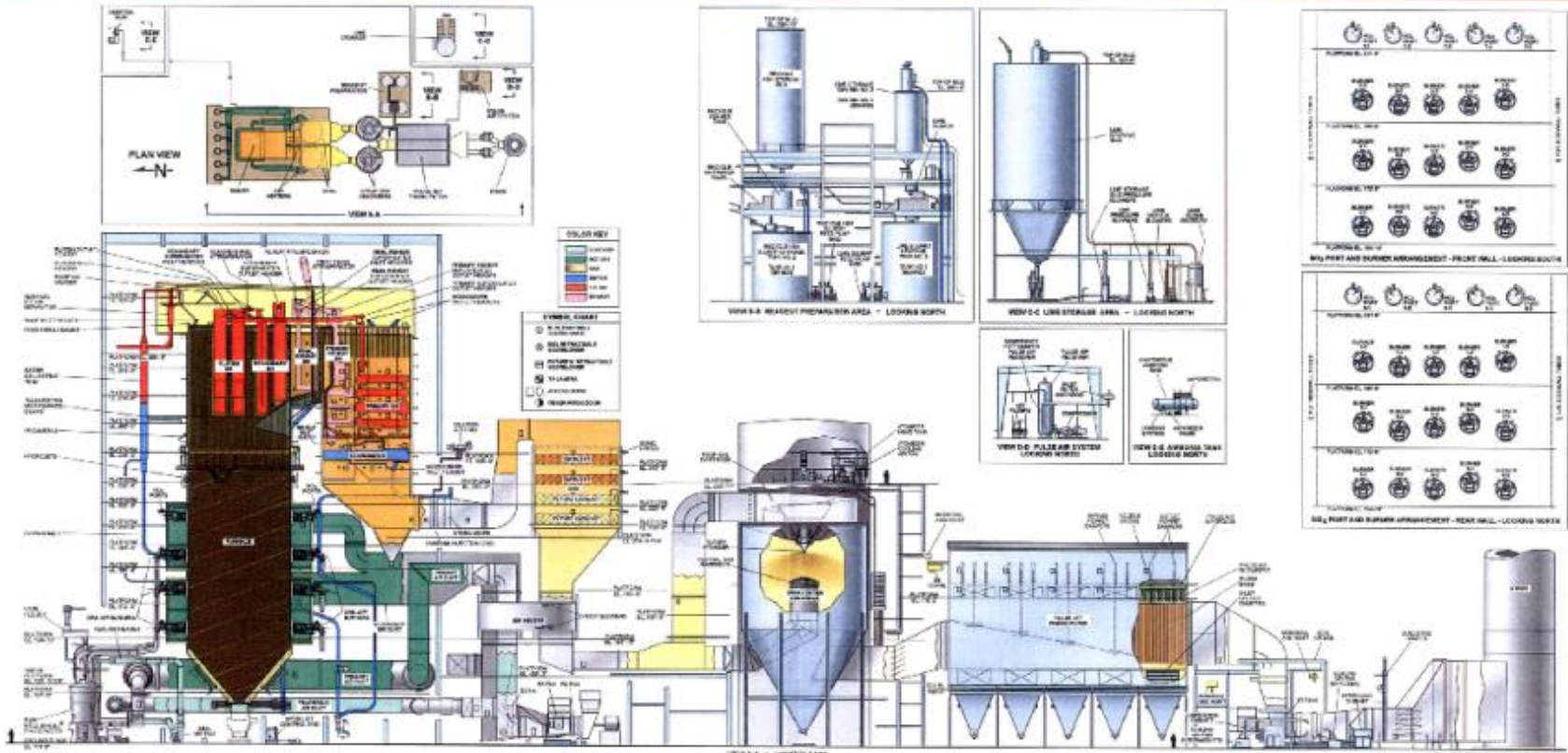
- B&W Ultra-Supercritical PRB Pulverized Coal-fired Balanced Draft, Once Through Benson Cycle boiler with Spiral-wound Furnace
- Latest B&W Start-up system with vertical steam separators, water collecting tank, and boiler circulation pump
- No division valves
- Water collecting tank acts as a drum on startup
- Once through above 32 % load
- Reaches supercritical around 70% load

Steam Generator

- Rated steam flow 4,419,400 lb/hr
- Main steam 3675 psi (@5% overpressure) 1115 deg. F
- Reheat steam 1125 deg. F
- Designed for sliding pressure operation
- Key USC materials :
 - SSH & Platens 347 H stainless
 - P91 and P92 headers
 - RH outlet bank 347 H/HFG stainless steel tubes
 - P92 MS piping & P91 Hot reheat piping

Air Permit Limits

- SO₂ limits 0.065 lb./mmbtu (30 day) / 480 lb./hr. (24 hr.)
- NO_x limits 0.067 lb./mmbtu (24 hr.) / 420 lb./hr. (24 hr.)
 NO_x Annual limit 0.050 lb./mmbtu
- Opacity limit 10% (6 minutes)
- CO limit 0.15 Lb./mmbtu (30 day) / 900 lb. / hr. (30 day)
- Mercury limit 1.2 Lb./tbtu (30 day average)

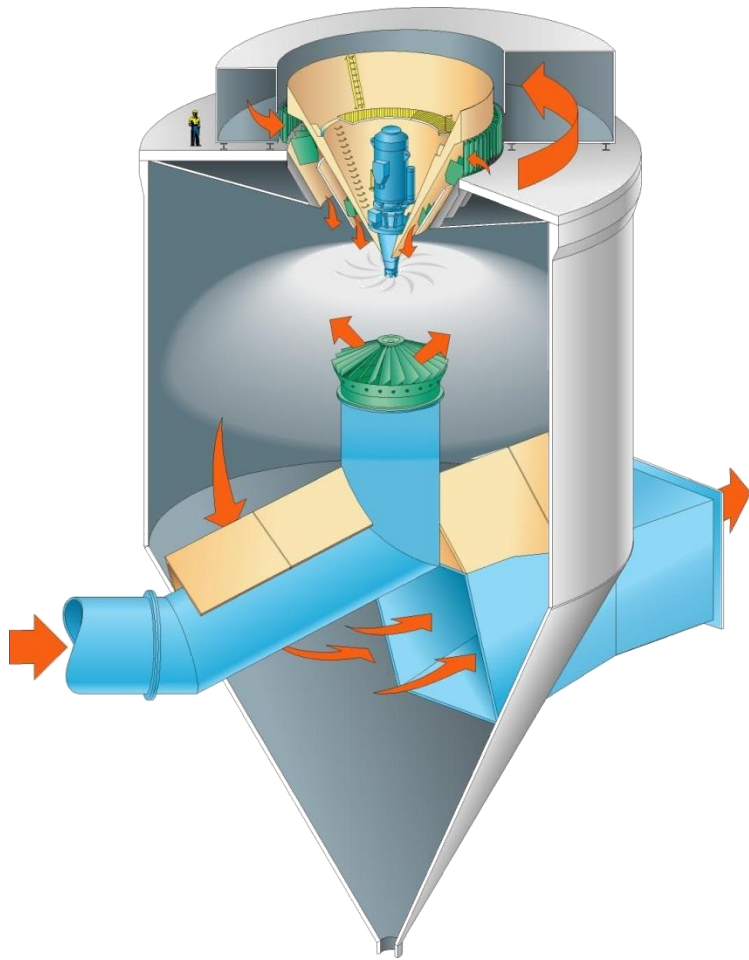


SWEPCO
JOHN W. TURK JR. POWER PLANT - UNIT 1
 FULTON, ARKANSAS

B&W CONTRACT: SP-187

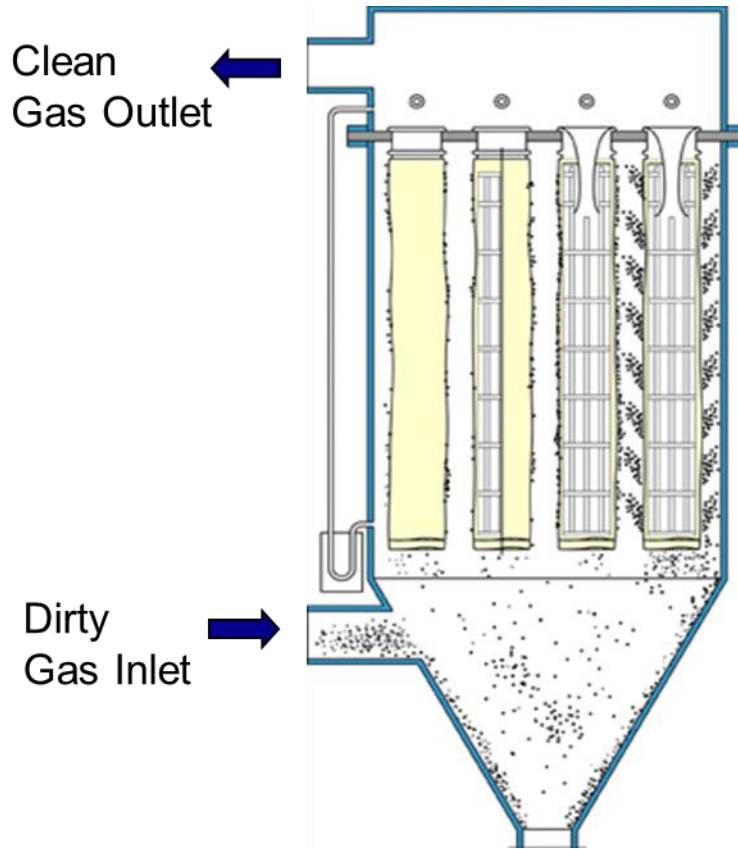
Normal Capacity 850 MW Superheater Outlet Pressure 2100 psig
 Steam Capacity 4,400,000 lbs/hr 700°F Outlet Temperature 714°F/262°C

Spray Dryer Absorber (SDA)



- Turk utilizes 2 x 50% SDA vessels.
- Flue gas enters at approx. 275 °F through roof and central gas dispersers.
- Rotary atomizer distributes mixture of fresh lime and recycle slurries.
- SDA vessel provides minimum 12 second residence time for drying.
- Dry flue gas at approx. 170 °F leaves the SDA and enters the PJFF Baghouse.

Pulse Jet Fabric Filter (PJFF) Baghouse



- 10 compartments and require only 9 in service.
- Filter bags can be changed while the unit is in service.
- 12,400 bags
- Residual SO₂ removal (15-20%) Fly ash and SDA waste are removed from the bags by individual dry air pulses, collected in hoppers and sent to either waste silo or recycle slurry process.

Plant Staffing

- Total plant staff—115
- Maintenance department—46
- Operations—34
- Lab / Chemist—7
- Material Handlers—20
- Administration—4
- Storeroom --4
- Plant staffing completed in Fall 2011
- Staffing design limited transfers and about 65 % local new hires
- UACCH Power Plant Technology – Associates Degree
- Lots & lots of training from supervisors, vendors & simulator time

Operations

- First fire on Natural Gas Aug. 21, 2012
- First fire on Coal Oct. 27, 2012
- First Unit Sync Nov. 8, 2012
- Unit 25% load on TDBFP Nov. 18, 2012 placed SDA in service and reached 300 M.W.
- Unit full load Dec. 17, 2012
- COD Dec 20, 2012 this was 25th time to sync to grid.

Control Room

All aspects of the plan are operated from the Main Control Room except water treatment.

There are 15,000 points of information monitored at all times.

Control Room managed by two personnel at all times.

We have a high fidelity simulator for training and testing.





Plant Awards

- POWER Magazine Plant of the Year
- Power Engineering Coal Project of the Year
- EEI Edison Award
- ENR National Best Industrial Project
- ENR Regional Best Project
- ENR Regional Excellence in Safety
- Finalist: Platts Global Energy Premier Construction Project
- Peabody Award for most Lowest Heat Rate 8927btu/net, this is 16% better than average Coal fleet.



Questions?