



Regulated & Renewable Energy

Belews Creek Coal Reliability Assurance Initiative

DE-CD0000172

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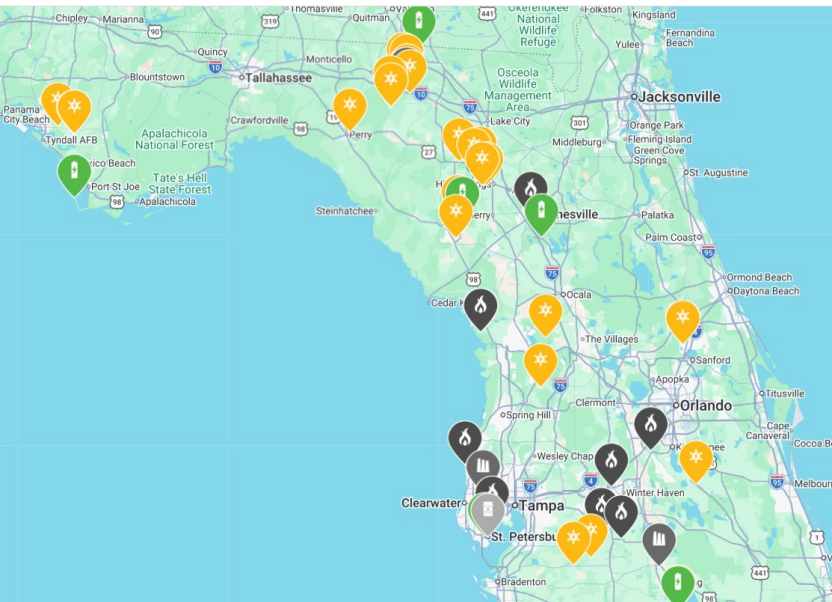
Acknowledgment and Disclaimer

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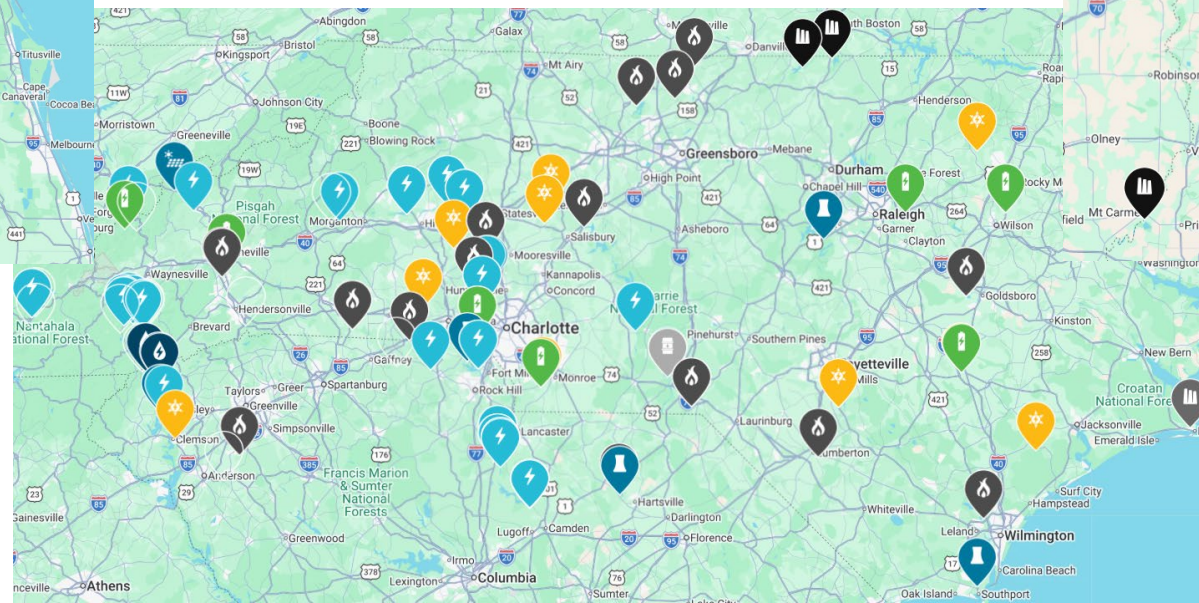
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Duke Energy Overview

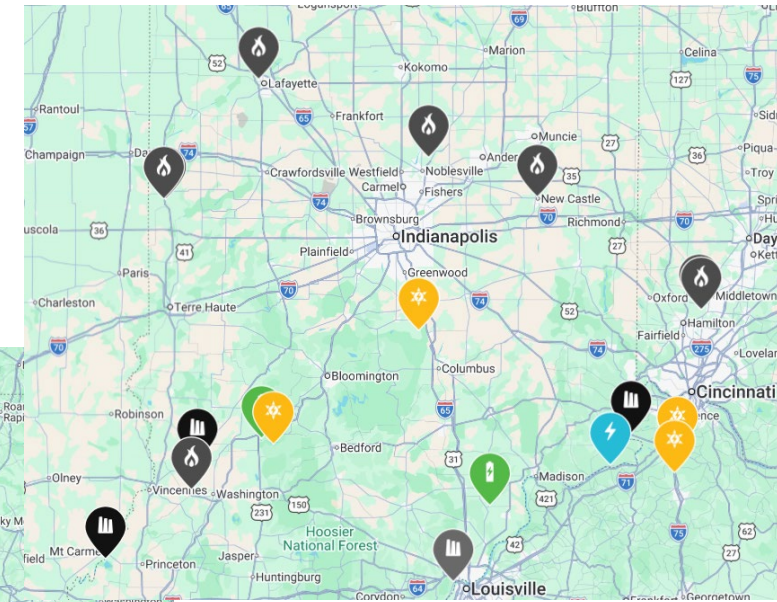
- Duke Energy (NYSE: DUK), a Fortune 150 company headquartered in Charlotte, N.C., is one of America's largest energy holding companies. The company's electric utilities serve 8.7 million customers in North Carolina, South Carolina, Florida, Indiana, Ohio and Kentucky, and collectively own approximately 55,700 megawatts of energy capacity. Duke Energy owns and operates a diverse mix of regulated power plants – including hydro, coal, nuclear, natural gas, solar, and battery storage.



Florida



Carolinas



Midwest

Executive Summary – Coal Reliability Assurance Initiative

- Continuously evaluate existing generation assets to enhance operational reliability.
- Reliability assurance work includes equipment major maintenance (e.g. fuel handing, boilers, turbines, fans, balance of plant).
- Ensures the generation needed to serve our customer base and soaring load growth.
- DOE award reflects Duke Energy's commitment to seek available opportunities to manage customer costs.
- Funding supports investments to improve the reliability of existing coal facilities (Belews Creek, Roxboro 2 & 3, and East Bend).
- Leveraged internal and external resources, Duke SMEs and OEMs, experienced in replacing obsolete or end-of life systems with more reliable equipment.
- Our rationale for selecting the work revolves around the highest valued impact on plant performance.
- Utilized in-house maintenance optimization system (Optim) for centerline equipment
- Analyzed degraders from GADs and leveraged inspections / performance data to prioritize other equipment.



Belews Creek Coal Reliability Assurance Initiative (DE-CD0000172)

Project Scope

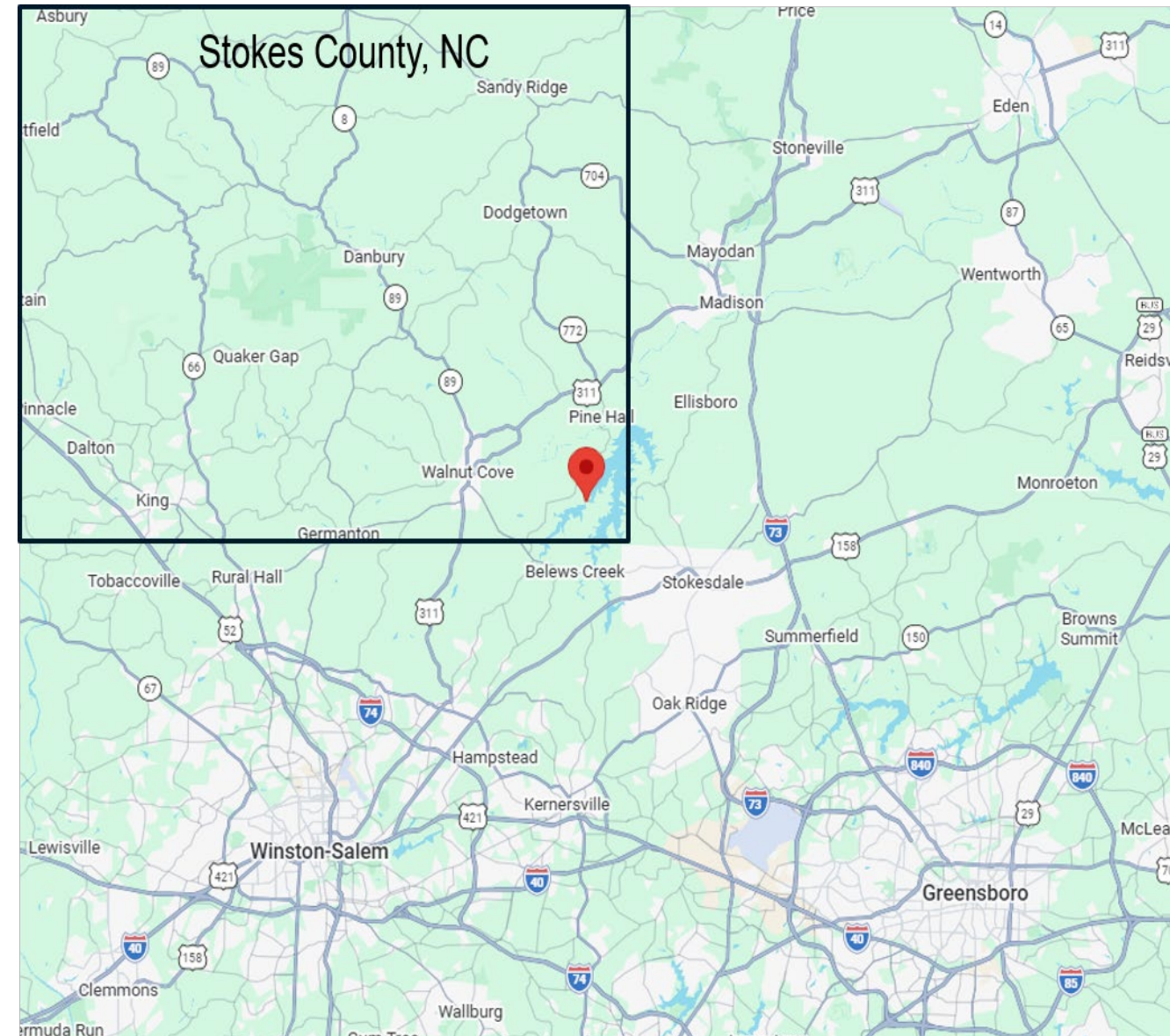
- 16 projects

Project Estimate

- Total Value: \$108,456,150
 - Duke Energy Carolinas Cost-Share: \$74,456,150
 - DOE Cost Share \$34,000,000 (maximum)
- Project Goals
 - Improve unit reliability by reducing unplanned outages (forced)
 - Increase unit availability, 3%
 - Safely execute project scope within schedule outage durations
- Project Location: Belews Creek Station, Stokes County, Belews Creek, NC
- Project Period: 09/01/2026 – 06/30/2029

Belews Creek Station Overview

- Fully owned and controlled by Duke Energy Carolinas
- One of the largest and most efficient coal plants in the country
- Sauratown township, rural population 5,408
- Largest taxpayer in Stokes County
- Currently anticipated to operate until the 2040s
- Two-unit supercritical coal and natural gas dual-fired
- 1,110 MW net output each unit

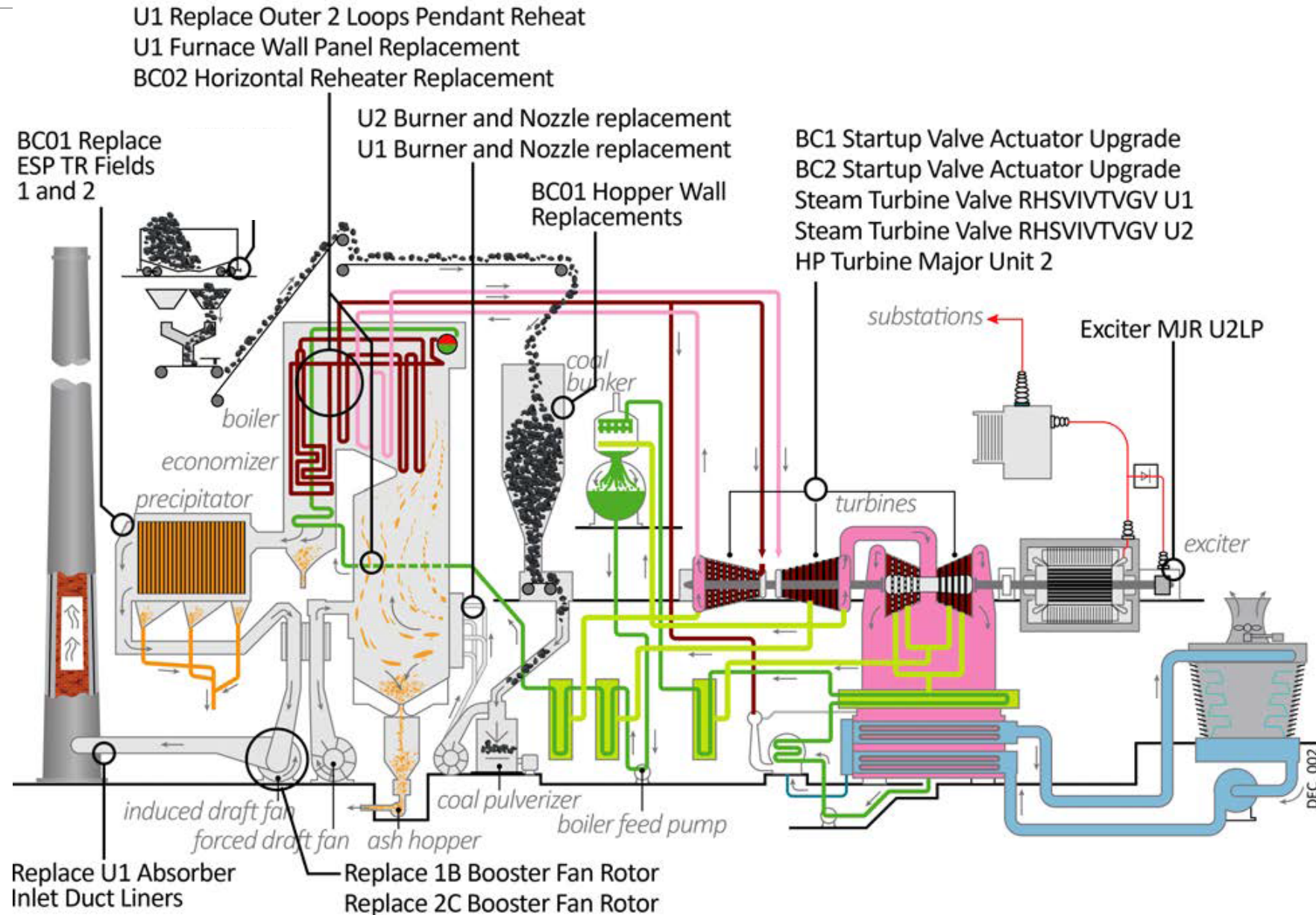


Belews Creek Station Overview (continued)

- Commissioned in 1975
- SCRs installed 2004
- Scrubbers installed 2008
- 50% natural gas firing, 2020
- Cross compound quad flow steam turbine
- 4 Generators (2 HP, 2 LP)



Project Scope



Project Technical Objective Listing

Technical Objective	Funding Project #	Project Description	DOE Share	Duke Share	Total	DOE Share Timing	
1	BC010812	U1 Reheat Outer Pendent Loops	\$ 2,753,297	\$ 6,029,410	\$ 8,782,707	Q3-2027	Spring 2027 Outage
2	BC010816	U1 Startup Valves	\$ 359,915	\$ 788,174	\$ 1,148,089	Q3-2027	
3	BC010779	U1 Preciptator Hopper Walls	\$ 417,627	\$ 914,557	\$ 1,332,184	Q3-2027	
4	BC010810	U1 Waterwall Panel	\$ 3,701,067	\$ 8,104,917	\$ 11,805,984	Q3-2027	
5	BC010811	U1 Burners and Nozzles	\$ 869,464	\$ 1,904,027	\$ 2,773,491	Q3-2027	
6	BC010742	U1 Steam Turbine Valves	\$ 1,922,891	\$ 4,210,914	\$ 6,133,806	Q3-2027	
7	BC010823	U1 Absorber Inlet Liners	\$ 343,983	\$ 753,284	\$ 1,097,268	Q3-2027	
8	BC010759	U1 ID Booster Fan Rotor	\$ 358,422	\$ 784,904	\$ 1,143,326	Q3-2027	
9	BC010761	U1 Preciptator Transformer/Rectifier	\$ 860,538	\$ 1,884,480	\$ 2,745,018	Q3-2027	
10	BC020549	U2 Burner and Nozzles	\$ 876,235	\$ 1,918,856	\$ 2,795,091	Q3-2028	Spring 2028 Outage
11	BC020486	U2 High Presure Steam Turbine Major	\$ 3,144,494	\$ 6,886,085	\$ 10,030,579	Q3-2028	
12	BC020547	U2 Startup Valves	\$ 364,819	\$ 798,912	\$ 1,163,731	Q3-2028	
13	BC020286	U2 Horizontal Reheater	\$13,975,435	\$30,604,621	\$ 44,580,056	Q3-2028	
14	BC020275	U2 Low Pressure Generator Exciter	\$ 1,515,004	\$ 3,317,688	\$ 4,832,692	Q3-2028	
15	BC020494	U2 Steam Turbine Valves	\$ 1,970,279	\$ 4,314,688	\$ 6,284,967	Q3-2028	
16	BC020579	U2 ID Booster Fan Rotor	\$ 368,245	\$ 806,416	\$ 1,174,661	Q3-2028	
17		Final BCA	\$ 198,283	\$ 434,217	\$ 632,500	Q4-2028	
			\$34,000,000	\$74,456,150	\$ 108,456,150		

Project Schedule

Belews Creek U1	Outage Timing	QTR
Initial BCA		Q4-2026
Long Lead Equip. Purchases	T-24 to T-18 months	Q3-2025
Contracts Issuance	T-3 months	Q4-2026
Outage Readiness Review	T-1 month	Q1-2027
Spring 2027 Outage	T-0 to T+3 months	Q2-2027
Work Complete Verification	T+3 months	Q3-2027
Cost-Share Submittal	T+5 months	Q3-2027
Belews Creek U2	Outage Timing	QTR
Long Lead Equip. Purchases	T-24 to T-18 months	Q3-2026
Contracts Issuance	T-3 months	Q4-2027
Outage Readiness Review	T-1 month	Q1-2028
Spring 2028 Outage	T-0 to T+3 months	Q2-2028
Work Completion Verification	T+3 months	Q2-2028
Cost-Share Submittal	T+5 months	Q3-2028
Final BCA		Q4-2028

Key Project Participants (Potential)

Supplier	Role
AirTek	Engineering - Precipitator
Andritz Group	Engineering - Precipitator Load Study
Babcock & Wilcox	Equipment - Boiler Burners
BHI Energy	Field Labor - Turbine and Cleaning
Boiler Tube Company of America	Equipment - Boiler Components
CORTEN	Materials Supplier
Dastur Energy	Program Management
Ferguson	Materials Supplier
Guidant Global	Field Oversight - Implementation Manager
Hydroair Hughes	Equipment - Valve Actuators
Incorp Industries	Construction - Scaffold and Insulation
MESA	Engineering Services
NWL	Equipment - Precipitator Controls
Piedmont Maintenance Services	Construction - Mech & Electrical
Power & Industrial Services	Equipment - Burner Nozzles
Rexa	Equipment - Valves
Rocky Mountain Industrial Services	Engineering - Boiler Chemical Cleaning
Riley Power	Engineering - Boiler Components
Siemens	Equip/Eng/Lbr - Turbine/Generator
Superior Piping Fabricators & Erectors	Construction - Mech & Electrical
TEiC	Construction - Mech & Electrical
Thompson Construction Services	Construction - Mech & Electrical
TLT-Turbo	Equipment - Booster Fan Rotors

Project Success Criteria

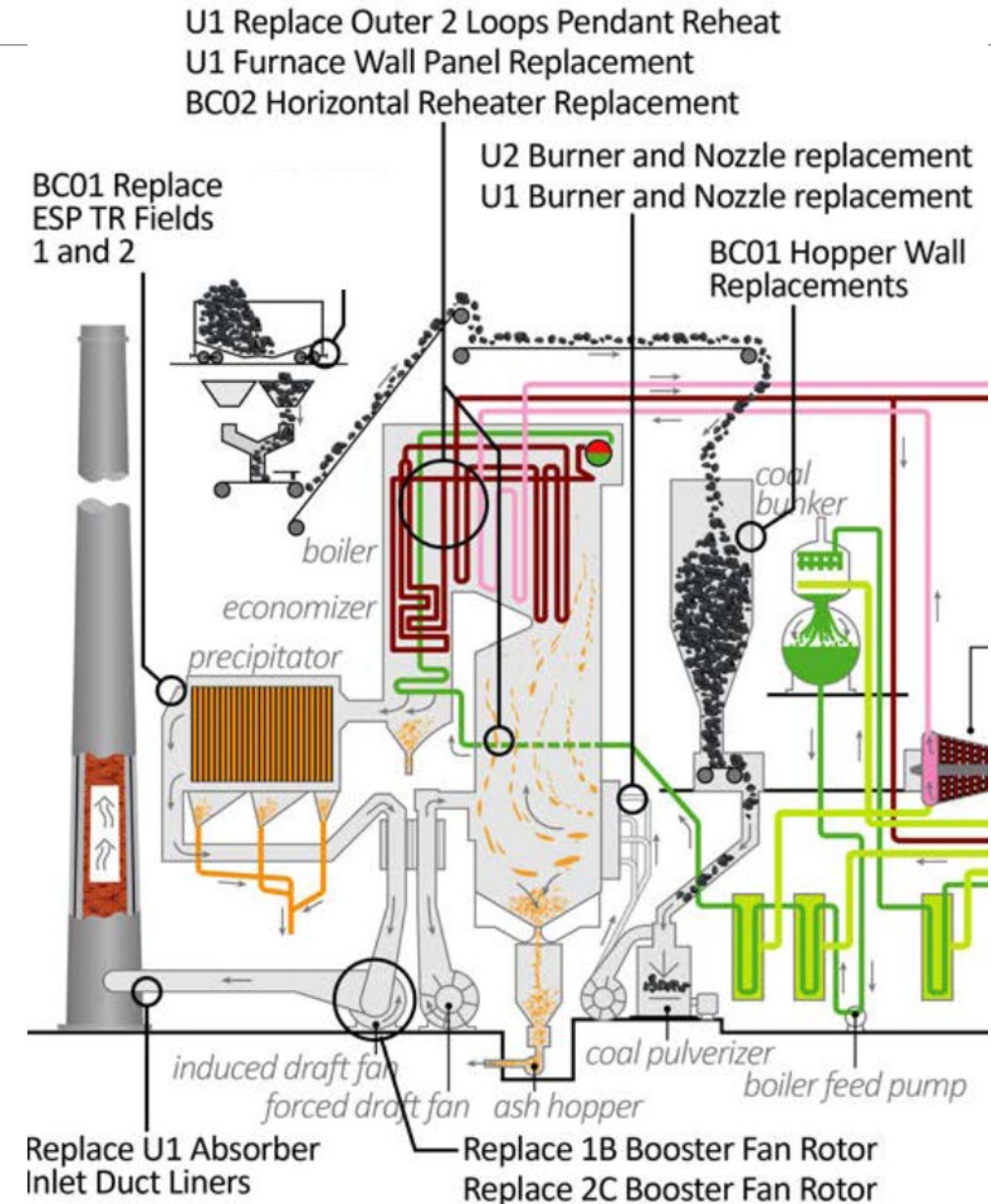
Boiler Components - 100% weld pass rate determined via linear phased array (LPA) ultrasonic inspection (UT).

Burners/Nozzles - 100% connections check. Normal flame conditions. Full burner check out and signoff by Duke SME.

Boost Fan Rotors - Vibration < 10 mils. Full booster fan checkout and signoff by Duke SME.

Precipitator - Output voltage > 30 kV DC and normal stack opacity operation. Successful completion of the OEM testing / startup plan.

Precipitator Hoppers & FGD Liners - 100% liner seam pass rate determined by visual inspection (VT).



Project Success Criteria

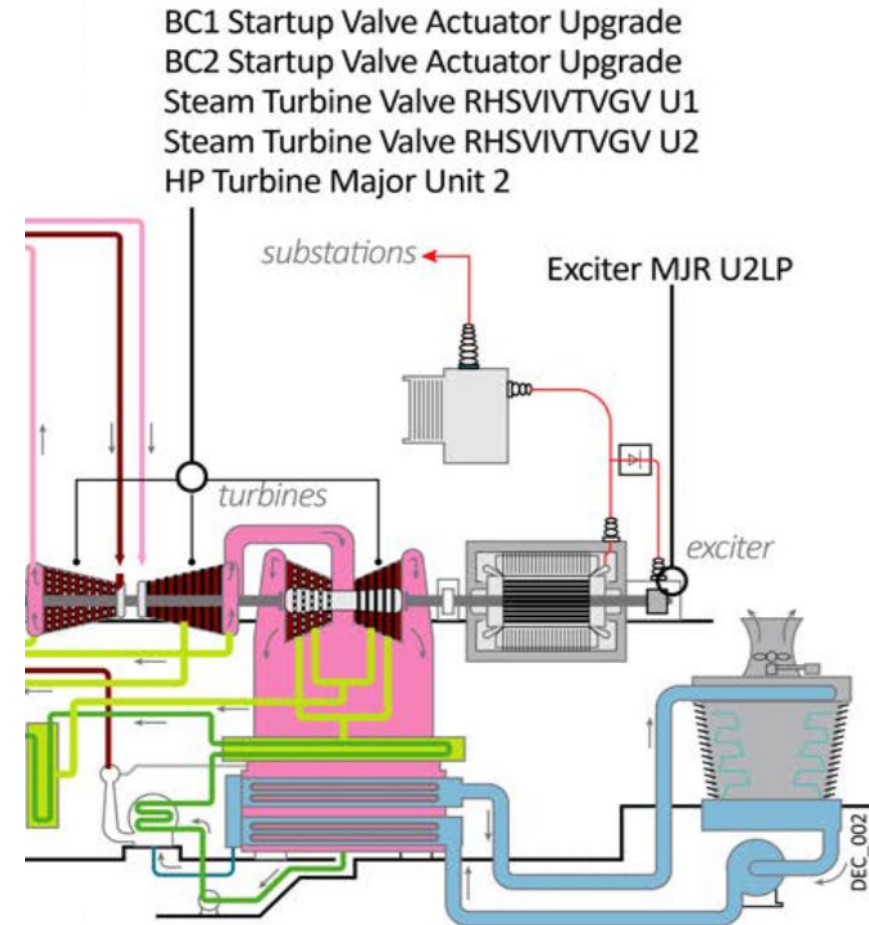
Steam Valves - Valve stroke blue check pass. Proper valve operation during post maintenance testing.

HP Major - Rotor vibration < 5 mils. Verification of proper HP turbine operation. Successful completion of the OEM testing / startup plan.

LP Exciter - Excitation voltage > 50 VDC. Verification of proper exciter operation. Successful completion of OEM testing / startup plan.

Startup Valves - Hydraulic pressure > 1500 psi. Successful completion of the OEM testing / startup plan.

All - Successful unit startup indicated by unit net output >1000 MW and operation of 30 days with stable conditions.



Intended Impact

Customer Benefit

- Projects will support sustained generating reliability and help keep customer costs low
- Prevent failures and costly downtime that threatens bulk electric system reliability and, therefore, impacts customer affordability.

Community Benefit

- Maintain permanent jobs further into the future by renewing critical station equipment
- ~\$56M of construction work in Stokes County from 2027-2028
- Sustain 2,220 MW dispatchable capacity

Station Benefit

- Improved equipment availability 3%
- Improved employee workload with reliable equipment
- Increased employee/station morale

Project Risks



TECHNICAL RISK

Reliability impacts from other plant systems mask the project's overall benefits.

Performance requires permit modification

MITIGATION

Track both unit reliability performance as well as system reliability performance.

Conduct environmental permit review.

MEDIUM RISK



COST RISK

Market craft labor rates (e.g. tube welder, millwright) increase significantly over current contracted rates.

MITIGATION

Evaluate alliance contract rates at T-9m and issue revised contracts, if necessary. Monitor market conditions quarterly.

MEDIUM RISK



SCHEDULE RISK

Equipment repair shop turn around time exceeds estimate.

Availability of quality tube welders decreases.

MITIGATION

Early procurement (T-6m) including shop reservation commitments

MEDIUM RISK



COMMERCIAL RISK

Expected equipment performance varies from projections.

MITIGATION

Include performance guarantees and validation testing in contract language. Utilize 3rd party technical oversight, when necessary.

LOW RISK

