GE Power

Boiler/ Environmental Flexibility portfolio for Low Load operation

Maximize Profit while ensuring equipment condition & predictable performance

Flexibility – Extend Operational Limits *

Load: 40% down to as low as 10%
Load Gradient: up to 5%/min
Safety: maintain plant integrity
Start-up: 1.5h hot / 4hr cold
Heat Rate: decrease of up to 2%
Emissions: maintain compliance

* Maximum Reduction requires Boiler, Turbine and AQCS scope

GE is the world’s leading supplier of coal plants, parts & services with over 100 years of experience. Deep process knowledge and commissioning expertise in both new and aftermarket upgrades have produced a resulting portfolio of simple and reliable solutions. Our holistic approach considers the entire system, achieving the desired outcome while avoiding undesirable potential issues. This comprehensive approach provides customers with a safe, reliable, environmental and cost-effective way to operate their equipment flexibly. For low load, Boiler systems are the most common constraint on a plant’s ability to operate effectively. To best implement low load capabilities, GE uses a 3-step approach. The first two steps typically only require boiler/ environmental scope.

Step 1: Assess current condition, evaluate then tune to uncover the potential of the existing equipment.
Modelling of a power plant using a digital twin will uncover flex capabilities that can be made available with minimum change. For example, tuning of firing system controls can aid in ramp rate & low load and applying digital neural network controls can optimize as load and conditions vary.

Step 2: Minor Upgrade to further extend flexible operation.
To achieve further improvements in minimum stable load as well as safe and reliable standard for “duck curve” cycling, typically replacement parts and sometimes, minor upgrades, are needed. Focus areas are the controls, firing, and Air Quality Control Systems (AQCS).

One example is GE’s Digital Boiler Plus* [DB+] increases system performance, safety and protects your investment, ensuring continued optimal operation. Another example is GEs burner tip upgrade technology. The AQCS system equipment will need adjustments to optimize performance while ensuring meeting continued emissions compliance levels.

Step 3: Retrofit reduces load to as much as 10%.
Aggressive low load operation requires significant boiler and turbine upgrades. GE modelling optimizes portfolio selection for the minimum investment to meet the required outcome. Digital ensures reliability and other targets.

Fact sheet
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**Boiler/Environmental Flexibility Portfolio for Low Load Operation**

**Firing System:**
- Burner Tuning
- Advanced Burners
- Flame Scanners
- Plasma Ignition
- Damper/Tilt Compartment
- New Windbox
- Gas Co-Firing

**Service - Uncover & Tune:**
- Inspect & Assessment
- Boiler & AQCS Tuning
- Engineering Review/Study
- PressureWave® Cleaning

**Step 1 - Uncover & Tune**
- Invest in maintenance and monitoring to uncover potential issues and tune the system for optimal performance.

**Step 2 - Parts, Upgrades & Digital Optimization**
- Replace worn parts and upgrade existing systems for enhanced efficiency.
- Utilize digital solutions for real-time monitoring and optimization.

**Step 3 - Modify & Advanced Digital System in conjunction w/Turbine**
- Integrate advanced digital systems to improve performance and reduce emissions.

**Emissions Compliance:**
- NOx, SOx, PM Control Tuning
- CFD Flow Modeling

**Valves & Controllers**
- Hot Water Recirc System
- Econ Bypass
- IsoSwirl
- Umbrella SNCR

**Supplemental SCR System**
- SOx

**SulfTrac Sulfine Analyzer**
- Multi-vane SDA Disperser
- Valves & Controllers

**Particulate Matter**
- ESP Dampers
- Duct Mods
- Supplemental Heating

**Investment Walk Steps**

**STEP 1 UNCOVER & TUNE**
- Inspect, Assess Condition
- Boiler & AQCS Tuning
- Burner, Mill, Control Loop Tuning
- Digital Solutions
- Engineering Review / Study
- CFD Flow Modeling

**STEP 2 MINOR UPGRADE**
- Advanced Burners, Scanners, Plasma
- Mill, Feeder & other Parts
- IsoSwirl, USNCR, HWRS, Econ Bypass
- SulfTrac & Multi-vane SDA Disperser
- ESP Dampers & Duct Mods
- I & C modifications
- Additional Digital Solutions (i.e. DB+)

**STEP 3 MODIFY (in conjunction w/Turbine)**
- Pressure Parts Advanced Materials
- Mill & Firing Systems Upgrade
- Supplemental SCR System
- Gas Co-Firing
- Digital Health & Reliability

To learn more about this offering, contact your GE Sales Representative or visit ge.com

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