## Table of Contents

1. **General**
   - Definitions

2. **Guarantees**
   - Performance Guarantees
   - Guarantee Base Conditions
   - Functional Requirements
   - Guaranteed Emissions
     - NGCC Emission Guarantees
     - Balance of Facility Emissions
     - Guaranteed Liquid Effluent Discharge

3. **Testing Requirements**
   - General
   - Performance Test Conditions
   - Performance Test Interruptions
   - Corrections
     - Correction Curves
     - Performance Guarantee Test Degradation
   - Performance Test Procedures
     - Content
     - Performance Test Points and Instrumentation

4. **Performance Tests**
   - Contractor's Preliminary Performance Testing
   - Performance Guarantee Tests
     - Thermal Performance
     - Emissions
     - Not Used
     - Sound Performance
     - Starting Reliability Test
     - Reliability Test
   - Functional Tests
     - Start-up Duration Test

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Exhibit G – Guarantees and Performance Test Procedure
Page 1 of 31
4.3.2 Ramp Rate Test .......................................................................................... 27
4.3.3 Workplace Sound Survey .......................................................................... 27
4.3.4 Operability Tests ....................................................................................... 28
4.3.5 Raw Water Pre-Treatment System Test .................................................... 28
4.3.6 Cycle Makeup Water Treatment System Test ........................................... 29

5.0 DEMONSTRATION TESTS .................................................................................. 29
5.1.1 Cooling Tower Performance Test .............................................................. 29
5.1.2 Evaporative Cooler Effectiveness Test ...................................................... 29

6.0 PERFORMANCE TEST RESULTS ......................................................................... 30

Exhibit G – Guarantees and Performance Test Procedure
EXHIBIT G - GUARANTEES AND PERFORMANCE TEST PROCEDURE

1.0 GENERAL

1.1 DEFINITIONS

"Air Emission Tests" means the Performance Guarantee Tests to determine whether the Facility has satisfied the Guaranteed Air Emissions.

"Balance of Facility Guaranteed Emissions" shall mean each of the Guaranteed Emissions set forth in Table 2.4-2 through Table 2.4-4.

"Cold Start-up" means a start-up of the Facility after it has been shut down for more than sixty (60) hours.

"Cold Start-up Emissions" means accumulated emissions of CO and NOx in lb/event from initial introduction of Fuel to the CTGs to the instance when CO and NOx emissions meet the Guaranteed Emissions values in ppmvd @15% O2 at the HRSG stack at during Cold Start-up.

"CTG" means combustion turbine generator.

"Cure Period" has the meaning set forth in Section 3.6.2 of this Exhibit G.

"Demonstration Tests" means the tests, conducted in accordance with the Performance Test Procedures, outlined in Article 5 of this Exhibit.

"EAF" has the meaning set forth in Section 4.2.6 of this Exhibit G.

"Emission Tests" means the Performance Guarantee Tests to determine whether the Facility has satisfied the Guaranteed Emissions.

"Equivalent Degradation Hours" has the meaning set forth in Section 3.2.4 of this Exhibit G.

"Facility Ramp Rate" means the ramp rate set forth in the table set forth in Section 2.3 of this Exhibit G.

"Functional Tests" means the tests, conducted in accordance with the Performance Test Procedures, to demonstrate satisfactory performance of the Work and that the Facility has been designed and constructed and is capable of performing according to the requirements of the Contract.

"Guarantee Base Conditions" has the meaning set forth in Section 2.2 of this Exhibit G.
“Guaranteed Air Emissions” means the emission limits listed in Sections 2.4.1 and 2.4.2 of this Exhibit G.

“Guaranteed Emissions” means the emission limits listed in Sections 2.4.1, 2.4.2, and 2.4.3 of this Exhibit G.

“Guaranteed Liquid Effluent Discharge” means the Performance Guarantee set forth in Section 2.4.3.

“Guaranteed Net Electrical Output” means the Performance Guarantee for Net Electrical Output set forth in the table set forth in Section 2.1 of this Exhibit G.

“Guaranteed Net Heat Rate” means the Performance Guarantee for Net Heat Rate set forth in the table set forth in Section 2.1 of this Exhibit G.

“Guaranteed Reliability” means the Performance Guarantee for reliability during the Guaranteed Reliability Period set forth in the table set forth in Section 2.1 of this Exhibit G.

“Guaranteed Reliability Period” has the meaning set forth in Section 4.2.6 of this Exhibit G.

“Guaranteed Sound Emissions” mean the sound levels set forth in the table set forth in Section 2.1 of this Exhibit G.

“Guaranteed Starting Reliability” means the Performance Guarantee for Starting Reliability during the Guaranteed Reliability Period set forth in the table set forth in Section 2.1 of this Exhibit G.

“Hot Start-up” means a start-up of the Facility after it has been shut down for up to ten (10) hours.

“Hot Start-up Emissions” means accumulated emissions of CO and NOx in lb/event from initial introduction of Fuel to the CTGs to the instance when CO and NOx emissions meet the Guaranteed Emissions values in ppmvd @15% O2 at the HRSG stack during Hot Start-up.

“Minimum CTG Emissions Compliance Load” means sixty percent (60%) of CTG base load across the specified ambient temperature with all Guaranteed Emissions achieved.

“Minimum Emissions Compliance Load” or “MECL” means the Net Electrical Output of the Facility with one CTG out of service and the other CTG operating at Minimum CTG Emissions Compliance Load.

“Net Electrical Output” means the average electrical output of the Facility as measured at the high side of the STG and CTG step-up transformers, determined by dividing the sum of the
kilowatt-hours generated during the Performance Test segment by the number of hours in the Performance Test segment, as adjusted for deviations from Guarantee Base Conditions.

"Net Heat Rate" means the aggregate amount of heat content of all Fuel consumed during the Performance Test segment by the Facility divided by the Net Electrical Output for that Performance Test segment, as adjusted for deviations from Guarantee Base Conditions.

"NGCC Guaranteed Emissions" shall mean each of the Guaranteed Emissions set forth in Table 2.4-1.

"Performance Guarantees" shall mean each of the guaranteed performance requirements as set forth in Section 2.1 of this Exhibit G.

"Performance Guarantee Tests" means the tests, conducted in accordance with the Performance Test Procedures, to determine whether the Facility has satisfied the Performance Guarantees.


"Performance Test Procedures" means the final detailed procedures for conducting the Performance Tests that are prepared by Contractor in accordance with this Exhibit G and approved in writing by the Owners.

"Reliability Test" has the meaning set forth in Section 4.2.6 of this Exhibit G.

"Reliability Test Interruption" has the meaning set forth in Section 4.2.6 of this Exhibit G.

"Starting Reliability" has the meaning set forth in Section 4.2.5 of this Exhibit G.

"STG" means steam turbine generator.

"Thermal Performance Tests" means the tests to demonstrate the achievement of the Guaranteed Net Electrical Output and the Guaranteed Net Heat Rate.

"Warm Start-up" means a start-up of the Facility after it has been shut down for more than ten (10) hours and less than sixty (60) hours.

"Warm Start-up Emissions" means accumulated emissions of CO and NOx in lb/event from initial introduction of Fuel to the CTGs to the instance when CO and NOx emissions meet the Guaranteed Emissions values in ppmvd @15% O2 at the HRSG stack during Warm Start-up.
## GUARANTEES

The Facility shall meet the following guarantees.

### 2.1 PERFORMANCE GUARANTEES

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Performance Guarantee</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guaranteed Net Electrical Output</td>
<td>&gt; 642,428 kW</td>
<td></td>
</tr>
<tr>
<td>Guaranteed Net Heat Rate</td>
<td>&lt; 6,655 Btu/kWh (HHV)</td>
<td></td>
</tr>
<tr>
<td>Guaranteed Starting Reliability</td>
<td>= 90% based on at least 10 starts during Reliability Test</td>
<td></td>
</tr>
<tr>
<td>Guaranteed Reliability (EAF)</td>
<td>≥ 98%</td>
<td></td>
</tr>
<tr>
<td>Near Field Sound</td>
<td>≤ 85 dBA</td>
<td></td>
</tr>
<tr>
<td>Property Boundary Sound</td>
<td>≤ 55 dBA</td>
<td>Average sound level measured and determined in accordance with Section 4.2.4.2 of this Exhibit G.</td>
</tr>
</tbody>
</table>

Each of the Emission Guarantees shall be met as defined in this Exhibit G and Exhibit P.

[*] Net Heat Rate calculations shall include all Fuel utilized including, without limitation, for Fuel gas compressor auxiliary power consumption.

[**] These are the "Guaranteed Sound Emissions."

### 2.2 GUARANTEE BASE CONDITIONS

Facility parameters measured or calculated during the Thermal Performance Tests shall be corrected to the following conditions (the "Guarantee Base Conditions"): 

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Dry-Bulb Temperature</td>
<td>89 °F</td>
</tr>
<tr>
<td>Ambient Wet-Bulb Temperature</td>
<td>79.3 °F</td>
</tr>
<tr>
<td>Barometric Pressure</td>
<td>29.42 inches Hg</td>
</tr>
<tr>
<td>Steady State Load</td>
<td>100%</td>
</tr>
<tr>
<td>Generator Power Factor</td>
<td>0.85</td>
</tr>
<tr>
<td>Evaporative Cooler Status</td>
<td>Off</td>
</tr>
<tr>
<td>Natural Gas Higher Heating Value</td>
<td>22,689 Btu/lb</td>
</tr>
<tr>
<td>Natural Gas Supply Temperature</td>
<td>50 °F</td>
</tr>
<tr>
<td>Natural Gas Supply Pressure</td>
<td>Minimum 500 psig</td>
</tr>
</tbody>
</table>

Exhibit G – Guarantees and Performance Test Procedure
### Condition

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP3 as identified in Exhibit T</td>
<td></td>
</tr>
<tr>
<td>HRSG Drum Blowdown</td>
<td>0%</td>
</tr>
<tr>
<td>CTG Fuel Efficiency Heater</td>
<td>In Service</td>
</tr>
<tr>
<td>Auxiliary Boiler</td>
<td>Off</td>
</tr>
</tbody>
</table>

### FUNCTIONAL REQUIREMENTS

Contractor shall design the Facility to satisfy the following functional requirements, which shall be demonstrated during the Functional Tests as outlined herein:

<table>
<thead>
<tr>
<th>Functional Requirement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold Start – up Duration</td>
<td>240 minutes</td>
</tr>
<tr>
<td>Warm Start – up Duration</td>
<td>130 minutes</td>
</tr>
<tr>
<td>Hot Start – up Duration</td>
<td>100 minutes</td>
</tr>
<tr>
<td>Facility Ramp Rate</td>
<td>30 MW per minute</td>
</tr>
<tr>
<td>Minimum Load (one CTG at Minimum CTG Emissions Compliance Load (tested on each CTG with the STG in service))</td>
<td>225 MW (at 57.7°F ambient temperature in 1x1 mode with CTG at MECL)</td>
</tr>
<tr>
<td>Evaporative Cooler Effectiveness</td>
<td>85 percent</td>
</tr>
<tr>
<td>Raw Water Pre-Treatment System Design Flow</td>
<td>3,500 gpm</td>
</tr>
<tr>
<td>Raw Water Pre-Treatment System Operation Time between Regenerations / Backflush</td>
<td>5 hours (Filter press sized for 5 cycles/day)</td>
</tr>
<tr>
<td>Cycle Makeup Water Treatment System Design Flow</td>
<td>91 gpm per train</td>
</tr>
<tr>
<td>Cooling Tower Cold Water Temperature at Guarantee Base Conditions</td>
<td>90.5°F</td>
</tr>
</tbody>
</table>

### GUARANTEED EMISSIONS

#### NGCC Emission Guarantees

Table 2.4--1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Guaranteed Emissions</th>
</tr>
</thead>
</table>

Exhibit G – Guarantees and Performance Test Procedure

Page 7 of 31
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Guaranteed Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Input, MMBTU/HR (HHV)</td>
<td></td>
</tr>
<tr>
<td>Summer Day (89°F, 66%RH)</td>
<td>&lt;5041.9</td>
</tr>
<tr>
<td>Winter Day (14°F, 60%RH)</td>
<td>&lt;5206.0</td>
</tr>
<tr>
<td>Total Facility heat input, two CTG</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>NOx ppmvd @15% O2</td>
<td>9.0</td>
</tr>
<tr>
<td>From Minimum Emissions Compliance Load</td>
<td></td>
</tr>
<tr>
<td>(tested with each CTG out of service)</td>
<td></td>
</tr>
<tr>
<td>over the extreme ambient temperature</td>
<td></td>
</tr>
<tr>
<td>range, and over the range of fuel</td>
<td></td>
</tr>
<tr>
<td>analyses</td>
<td></td>
</tr>
<tr>
<td>CO ppmvd @15% O2</td>
<td>0.8</td>
</tr>
<tr>
<td>From Minimum Emissions Compliance Load</td>
<td></td>
</tr>
<tr>
<td>(tested with each CTG out of service)</td>
<td></td>
</tr>
<tr>
<td>over the extreme ambient temperature</td>
<td></td>
</tr>
<tr>
<td>range, and over the range of fuel</td>
<td></td>
</tr>
<tr>
<td>analyses</td>
<td></td>
</tr>
<tr>
<td>VOC *(non-methane, non-ethane) ppmvd @15% O2 as CH4</td>
<td>0.5</td>
</tr>
<tr>
<td>From Minimum Emissions Compliance Load</td>
<td></td>
</tr>
<tr>
<td>(tested with each CTG out of service)</td>
<td></td>
</tr>
<tr>
<td>over the extreme ambient temperature</td>
<td></td>
</tr>
<tr>
<td>range, and over the range of fuel</td>
<td></td>
</tr>
<tr>
<td>analyses</td>
<td></td>
</tr>
<tr>
<td>PM (Filterable) lbm/hr</td>
<td>27</td>
</tr>
<tr>
<td>Total for two CTG's</td>
<td></td>
</tr>
<tr>
<td>from Minimum Emissions Compliance Load</td>
<td></td>
</tr>
<tr>
<td>(tested with each CTG out of service)</td>
<td></td>
</tr>
<tr>
<td>over the extreme ambient temperature</td>
<td></td>
</tr>
<tr>
<td>range, and over the range of fuel</td>
<td></td>
</tr>
<tr>
<td>analyses</td>
<td></td>
</tr>
<tr>
<td>PM (Total PM/PM10/PM2.5) lbm/hr</td>
<td>54</td>
</tr>
<tr>
<td>Total for two CTG's</td>
<td></td>
</tr>
<tr>
<td>from Minimum Emissions Compliance Load</td>
<td></td>
</tr>
<tr>
<td>(tested with each CTG out of service)</td>
<td></td>
</tr>
<tr>
<td>over the extreme ambient temperature</td>
<td></td>
</tr>
<tr>
<td>range, and over the range of fuel</td>
<td></td>
</tr>
<tr>
<td>analyses</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Guaranteed Emissions</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Sulfur Dioxide, SO(_2) lbm/hr</td>
<td>4.0</td>
</tr>
<tr>
<td>Sulfuric Acid Mist, H(_2)SO(_4) lbm/hr</td>
<td>6.0</td>
</tr>
<tr>
<td>Formaldehyde ppbvd @15% O(_2)</td>
<td>91</td>
</tr>
</tbody>
</table>

### Table 2.4--1

#### Parameter

- Guaranteed Emissions
- Guaranteed Emissions at Substantial Completion/Commercial Operation
- Guaranteed Emissions at Final Completion

#### NOx (lbm/start)

- Cold Start-up Emissions: 489
- Warm Start-up Emissions (Emissions Fast Start Mode): 235

#### CO (lbm/start)

- Cold Start-up Emissions: 9644
- Warm Start-up Emissions (Emissions Fast Start Mode): 5175

---

Exhibit G – Guarantees and Performance Test Procedure

Page 9 of 31
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Guaranteed Emissions at Substantial Completion/Commercial Operation</th>
<th>Guaranteed Emissions at Final Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOx (lbm/start)</td>
<td>150</td>
<td>108</td>
</tr>
<tr>
<td>CO (lbm/start)</td>
<td>2509</td>
<td>1829</td>
</tr>
<tr>
<td>Hot Start - up Emissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOx (lbm/start)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO (lbm/start)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shutdown Emissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOx (lbm/shutdown)</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>CO (lbm/shutdown)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*VOC are assumed to be less than fifty percent (50%) Saturated.

2.4.2 Balance of Facility Emissions

Table 2.4 - 2

<table>
<thead>
<tr>
<th>Units</th>
<th>Not to Exceed Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Input (HHV) MMBTU/HR</td>
<td>99.9</td>
</tr>
<tr>
<td>NOx LB/MMBTU</td>
<td>0.036</td>
</tr>
<tr>
<td>CO LB/MMBTU</td>
<td>0.075</td>
</tr>
<tr>
<td>Total PM LB/MMBTU</td>
<td>0.007</td>
</tr>
<tr>
<td>Total PM/PM10 LB/MMBTU</td>
<td>0.007</td>
</tr>
<tr>
<td>Total PM/PM2.5 LB/MMBTU</td>
<td>0.007</td>
</tr>
<tr>
<td>SO2 LB/MMBTU</td>
<td>0.003</td>
</tr>
<tr>
<td>VOC LB/MMBTU</td>
<td>0.008</td>
</tr>
</tbody>
</table>

The SO2 guarantee is based on a maximum 0.2 grains S /100 SCF in the natural gas.

Table 2.4 - 3

<table>
<thead>
<tr>
<th>Units</th>
<th>Not to Exceed Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Input (HHV) MMBTU/HR</td>
<td>&lt;7.60</td>
</tr>
<tr>
<td>NOx lb/hr</td>
<td>13.08</td>
</tr>
<tr>
<td>CO lb/hr</td>
<td>0.61</td>
</tr>
<tr>
<td>Total PM lb/hr</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Exhibit G – Guarantees and Performance Test Procedure
Total PM = 10 lb/hr  

Total PM = 2.5 lb/hr  

SO2 = 0.0124 lb/hr  

HC = 0.07 lb/hr

These emissions are based on the EDG specified in Section 18.9 of the EPC Specification (Caterpillar C27 750 kW).

**Table 2.4 - Cooling Tower Emissions**

<table>
<thead>
<tr>
<th>Units</th>
<th>Not to Exceed Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling Tower Water Flow</td>
<td>210,000 GPM</td>
</tr>
<tr>
<td>Drift Loss</td>
<td>0.001%</td>
</tr>
<tr>
<td>Drift Mass Flow Rate</td>
<td>1050.84 lb/hr</td>
</tr>
</tbody>
</table>

Emissions based on 700 mg/L total dissolved solids water.

Total PM = 0.73 lb/hr

**2.4.3 Guaranteed Liquid Effluent Discharge**

The Cane Run Station coal fired units currently have a Kentucky Pollution Discharge Elimination System (KPDES) permit. Refer to Exhibit P-1.

The KPDES permit will need to be revised to include the Facility's waste water flows. The Facility wastewater discharge shall comply with the discharge parameters of the current permit.

The Facility shall have two waste water outfall locations: 1) The cooling tower blowdown shall comply with existing permit Outfall 001 requirements; 2) the Facility waste water collection sump shall comply with the existing permit Outfall 004 requirements.

**3.0 TESTING REQUIREMENTS**

**3.1 GENERAL**

Contractor shall be responsible for carrying out the Performance Tests. The Performance Tests may not be started until after Mechanical Completion has been achieved and the notice required by Section 11.2 of the Agreement has been delivered to Owners.

The Contractor shall be responsible for the supply of technical personnel to the extent provided in Section 5.9 of the Agreement and all testing equipment and testing instrumentation. Contractor shall provide instrumentation to meet all uncertainty requirements of applicable test codes.
The Contractor shall be responsible for supplying technical supervision of the operation of Equipment during the Performance Test, and, to the extent permitted by Section 11.2 of the Agreement, the Contractor may provide test technicians for the collection of data and similar services to monitor and validate that the tests are performed in accordance with Performance Test Procedures.

At all times during the Performance Tests, the Facility shall achieve all Guaranteed Emissions and comply with all Applicable Laws and Permits to be considered a successful Performance Test. If all or any portion of the Facility fails to meet any Guaranteed Emissions or comply with Applicable Laws or Permits, then the Facility shall have failed such Performance Test. Contractor shall evaluate and remedy the cause of such failure before attempting the same Performance Test.

The Performance Tests shall be scheduled with due regard for minimizing the operating expenses of and maximizing revenues to be derived from Facility operations during such tests and in accordance with Owners' dispatch orders.

The Performance Test shall be conducted in the presence of Owners and in accordance with the requirements of this Exhibit G and the Performance Test Procedures. Owners shall be entitled to have representatives present at the Job Site to observe any Performance Tests and monitor the taking of measurements. The Owners reserve the right to artificially create conditions to verify the validity of any correction factor or curve.

The Owners reserve the right to complete additional component and Facility performance tests in addition to the Contractor completed Performance Testing.

Performance Testing shall commence at a time mutually agreed between the Owners and Contractor.

After Mechanical Completion, Start-Up and Initial Synchronization have been achieved, Contractor shall give Owners not less than ten (10) Days prior notice of the date Contractor anticipates that the Facility shall be ready for the initial Performance Tests. The Performance Tests shall be conducted (i) in the presence of Owners and (ii) utilizing the personnel provided by Owners, acting under the direct technical supervision and control of Contractor. If Contractor fails to successfully perform any of the Performance Tests, the defects, deficiencies and other conditions which so prevent performing such tests successfully must be immediately thereafter corrected and/or remedied in accordance with Section 11.4 of the Agreement. Upon completion of such corrective and/or remedial actions, Contractor shall re-perform the failed Performance Test upon not less than forty-eight (48) hours prior written notice to Owners. The foregoing procedures shall be repeated until all of the requirements of each Performance Test have been met and Substantial Completion or Commercial Operation achieved.
requirements and Prudent Utility Practices. Equipment shall not be operated in a manner that is not suitable for continuous operation of the Equipment or that risks damage to the Equipment or creates an unsafe operating condition. No auxiliary, standby, or temporary Equipment or machinery may be used during the performance of the Performance Tests unless otherwise approved by Owners in advance.

Repair of any part or replacement of any item of Equipment that could materially alter the performance of the Facility or the results of a Performance Test is not be permitted during the conduct of the Performance Test. If the Contractor performs any repair or alterations after a Performance Test that could affect the results of a previously conducted Performance Test, Contractor shall repeat the affected Performance Test.

The Contractor may not operate redundant components to obtain acceptable Performance Test results unless such use is normal operating practices as described in the Operating and Maintenance Manuals.

Performance Guarantee Tests shall be completed with the Facility DCS in automatic control with manual adjustment or manual control of Equipment operation only as approved by the Owners.

All Performance Tests shall be performed with the Facility operating wholly within its design ratings. Without limiting the foregoing, none of the following shall be permitted to occur:

- Overheating of components.
- Operation of tripping or limiting devices, except where the test is intended to demonstrate such operation.
- Rubbing, chaffing or other mechanism of accelerated wear.
- Exceeding of sound limits.
- Excessive power consumption.
- Manual intervention or assistance in automatic or unmanned functions and processes.
- Dangerous occurrences due to Facility operation or malfunction.
- Leaks from or into piping systems or vessels that could result in damage to operating Equipment.

The Contractor shall make no adjustments or modifications to the Facility prior to or during any Performance Test intended to temporarily improve the performance of the Facility for the Performance Test.

3.3 PERFORMANCE TEST INTERRUPTIONS

With the exception of the Reliability Test, if a test interruption occurs during a Performance Test, the Performance Test shall be restarted from the beginning. Test data gathered from the Performance Test prior to the interruption shall be discarded.
If a Performance Test is interrupted, the Contractor shall notify the Owners in accordance with the approved Performance Test Procedure and the Contractor shall identify the cause, remedy the problem that caused the interruption, and establish the procedure for re-conducting the Performance Test.

3.4 CORRECTIONS

The Contractor shall make every effort to run the Performance Tests at a condition as close to the Guarantee Base Conditions as feasibly possible to minimize the application of Performance Test corrections. For conditions that vary from the Guarantee Base Conditions, the Contractor shall analytically adjust Performance Test results through the application of corrections to as-measured test results in accordance with approved Performance Test Procedures.

Contractor shall conduct Performance Tests to demonstrate that the Performance Guarantees are achieved over the range of operating conditions as appropriate for the Performance Guarantee and as corrected back to the Guarantee Base Conditions.

3.4.1 Correction Curves

Correction curves shall be included in the Performance Test Procedures. These curves shall be designed to adjust the Performance Test results from actual ambient conditions to the Guarantee Base Conditions. Each of the correction curves shall have a range to suit any possible range of ambient conditions. Each curve shall be provided in both graphical and numerical format.

3.4.2 Performance Guarantee Test Degradation

The Contractor shall use commercially reasonable efforts to minimize CTG degradation prior to conducting the Performance Tests. In the event that a Performance Guarantee Test is delayed beyond 2000 Equivalent Degradation Hours (EDH) of operation of either CTG, [non-recoverable] degradation shall be allowed on the applicable CTG(s) in accordance with Siemens’ degradation curves approved by the Owners. The start of degradation on the degradation curves shall be at 2000 Equivalent Degradation Hours with zero degradation. No other degradation allowances shall be allowed.

If any major or minor maintenance operations are performed on the CTG’s, then the relevant data provided by Contractor shall be used to reduce the Equivalent Degradation Hours.

EDH = a (BLOH) + b (PLOH) + c (NS) + d (TGH) + e (TS)

Where:

EDH = Equivalent Degradation Hours
BLOH = (GBLOH)
BLOH = Base load operating hours
GBLOH = Number of operating hours on gas fuel at Base or part load
PLOH = Peak Load Operating Hours
GPLOH = Number of operating hours on gas fuel at a load above Base load
NS = Number of normal starts
TGH = Turning Gear Hours
TS = Number of tripped shutdowns and fired aborts. A tripped shutdown is where the Unit is shutdown without any attempt to control the rate of shutdown. A fired abort occurs during a start when the combustor lights, but the Unit is not synchronized to the grid.

Factors:

a = Factor Relating BLOH to EDH = 1.0
b = Factor Relating PLOH to EDH = 3.0
c = Factor Relating NS to EDH = 20.0
d = Factor Relating TGH to EDH = 0.01
e = Factor Relating TS to EDH = 20 for fired aborts = 60 for tripped shutdowns at loads > minimum load but ≤ 25% = 120 for tripped shutdowns at loads > 25% but ≤ 50% = 160 for tripped shutdowns at loads > 50% but ≤ 75% = 200 for tripped shutdowns at loads > 75%
3.5 PERFORMANCE TEST PROCEDURES

Performance Test Procedures shall be prepared in general accordance with the ASME Performance Test Codes (PTC) and in strict accordance with the requirements in the Agreement. Mutually agreed upon deviations from the ASME PTC (or other applicable codes) may be incorporated in specific Performance Test Procedures. In the event of a conflict, the order of precedence shall be:

1) The Agreement
2) The Performance Test Procedure
3) The applicable ASME PTC or other performance test code

Performance Tests shall be completed with the Facility DCS in automatic control with no abnormal manual adjustment or manual control of Equipment operation.

In accordance with Section 11.1 of the Agreement, Contractor shall submit for approval of the Owners the Performance Test Procedures, including detailed test procedures for the Performance Tests based on the completed Facility design.

3.5.1 Content

The Performance Test Procedures shall include as a minimum for each Performance Test:

• The purpose of the Performance Test
• Performance Test responsibilities
• Applicable performance corrections and correction curves
• Codes and standards to be utilized and any mutually agreed upon exceptions to these codes and standards
• Data collection procedures
• Instrument list, including both permanent Facility and temporary Performance Test instrumentation to be utilized
• Performance Test operating procedures
• Allowable variation in measured parameters
• Valve line-up list
• Instrument accuracy requirements
• Sample data log sheets
• Pre-test uncertainty calculation per ASME PTC 19.1
• Notification procedures

3.5.2 Performance Test Points and Instrumentation

The Contractor shall specify a list of key instruments to be used during a Performance Test in the applicable Performance Test Procedures.
All permanent and temporary Performance Test measurement points shall be provided by Contractor in order to demonstrate fully that the Facility performance is in compliance with the Agreement. Contractor shall provide drawings indicating the points of measurement together with necessary isolation during Performance Tests. Contractor shall describe the means of measurement of the necessary parameters together with the anticipated standards and accuracy of the instruments.

The instruments shall be calibrated in accordance with the standards of a recognized national organization such as American Society of Testing and Materials (ASTM), Instrument Society of America (ISA), or the American Society of Mechanical Engineers (ASME). Contractor shall calibrate and install special test equipment or instrumentation used in testing.

A certified calibration curve (issued no more than six (6) months prior to the date of Performance Tests) for each Performance Test instrument shall be provided to the Owners not later than fifteen Days prior to the commencement of the Performance Tests. Contractor shall provide post-test re-calibration certificates within thirty Days of the Performance Tests only for the instruments with suspect readings. Calibration procedures and records shall be submitted to the Owners as part of the Contractor's written Performance Test reports. Facility and Performance Test instrumentation shall be calibrated immediately prior to the applicable Performance Test.

The Contractor shall design Performance Test procedures such that Performance Test data shall be monitored and recorded by permanent Facility instrumentation using the Facility DCS to the greatest extent possible. The Contractor shall ensure that the use of permanent Facility instrumentation shall in no way adversely impact the intended Performance Test accuracy and shall provide a pre-test uncertainty analysis based upon the intended instrumentation with the Performance Test Procedure.

Additional precision grade test instruments and signal sources shall be supplied by Contractor where necessary to comply with and to be used in accordance with the requirements of the appropriate test codes, and to achieve the accuracy requirements for carrying out the various Performance Tests as specified in the Agreement or if permanent Facility instrumentation is not installed at a location that requires test data collection.

Flow measuring devices (for fuel, water, steam, etc.) and thermocouples with their indicators that are used as test instruments shall be certified by an independent testing authority approved by the Owners.

Fuel calorific value measurements shall meet the requirements of the ASME Power Test Code 22 or equivalent as approved by the Owners.

The measurement values used in performance calculations shall be the arithmetical average of the observations made and recorded during the Performance Tests. As far as practical the Performance Test data shall be logged automatically on a data logger or the Facility DCS at a
rate in excess of one reading per minute. For parameters where this is not practical, observations shall be taken during each Performance Test at regular intervals not exceeding ten minutes.

3.6

DEFECTS DURING PERFORMANCE TESTS

3.6.1 Minimum Performance

After completion of any Performance Test (either an initial test or any retest), Owners and Contractor shall consult concerning the results of such Performance Test. If a Performance Test fails to establish that the Performance Guarantees have been met, Contractor shall, at its expense, immediately commence and promptly: (i) complete corrective measures to rectify the cause of such failure, including correcting defects or deficiencies in the Work (including redesign and replacement of any defective parts), (ii) make any necessary adjustments, and (iii) re-conduct the Performance Test, in each case, as soon as practicable.

3.6.2 Performance Cure Period

If the requirements of Substantial Completion have been satisfied, Contractor may take steps to improve the performance of the Facility until the Guaranteed Final Completion Date. If Contractor achieves Substantial Completion, but does not achieve Commercial Operation prior to the Guaranteed Commercial Operation Date, Owners shall make the Facility reasonably available for the purpose of curing and retesting the performance of the Facility up until the Guaranteed Final Completion Date (“Cure Period”); provided that such availability shall be subject to Owners’ operating needs for the Facility and Section 7.4 of the Agreement. If Contractor is unable to achieve the Performance Guarantees for which there are Performance Liquidated Damages, then the results of the last successfully completed Performance Test shall be used to determine the Facility performance for purposes of the amount of Performance Liquidated Damages payable by Contractor.

3.6.3 Retesting

Upon completion of such corrective action as detailed in Section 3.6.1 or 3.6.2, Contractor shall cause the Performance Tests to be re-performed. Performance Tests shall be repeated until the earliest to occur of (i) the Performance Guarantees are satisfied; (ii) to the extent that Section 7.2 or Section 7.3 of the Agreement permits the payment of Performance Liquidated Damages with respect to a Performance Guarantee that has not been achieved, such Performance Liquidated Damages are paid to the Owners, or (iii) with respect to Performance Tests other than the Reliability Test, the Guarantee Commercial Operation Date. If the results of any Performance Test are inconclusive because of erroneous, corrupted or inadequate data, such test shall be repeated. Contractor shall be responsible for costs of the qualified third party testing contractor, as well as costs incurred by Contractor, to the extent that any Performance Test shall be re-performed. Owners shall, subject to Section 7.4 of the Agreement, make the Facility
4.0 PERFORMANCE TESTS

4.1 CONTRACTOR'S PRELIMINARY PERFORMANCE TESTING

During the period prior to Commercial Operations or Substantial Completion, Contractor may at its own cost (including personnel, test equipment, material and any other costs) carry out preliminary testing and make such adjustments as may be necessary to achieve Performance Guarantees.

Contractor shall furnish Owners with a description of its proposed preliminary performance testing program, together with calibration certificates for the test equipment. Owners shall have full access to witness all calibrating and checking of instruments and other apparatus and all preliminary testing performed. Owners shall receive copies of a preliminary test report as well as all raw test data collected within forty eight (48) hours of the test.

4.2 PERFORMANCE GUARANTEE TESTS

Contractor shall perform a series of Performance Guarantee Tests to demonstrate that the Performance Guarantees have been achieved.

4.2.1 Thermal Performance

The Thermal Performance Tests are the tests to demonstrate the achievement of the Guaranteed Net Electrical Output and the Guaranteed Net Heat Rate. The Thermal Performance Test procedures shall be in general accordance with ASME PTC 46, Performance Test Code on Overall Facility Performance.

For three (3) hours immediately preceding the Thermal Performance Test period, the Facility shall operate at a stable load to ensure that it has reached equilibrium and has not undergone abnormal variations in operating parameters in excess of those identified in the Performance Test Procedures. All other conditions shall be in accordance with the Performance Test Procedure requirements.

Two Thermal Performance Tests, each of 4 hour duration, shall be conducted. The results shall be accepted if the measured heat rates and Net Electrical Output from the two Thermal Performance Tests are within one half of one per cent (0.5%) of each other. If the results are within one half of one per cent (0.5%) of each other, the final results shall be deemed to be the numerical average of the two results. Greater differences shall necessitate repeating both of the Thermal Performance Tests. The four (4) hour Thermal Performance Test period excludes any additional period required for the Facility to stabilize. The Thermal Performance Test shall be considered to be successfully passed only if the Guaranteed Net Electrical Output and Guaranteed Net Heat Rate are achieved while all of the other Performance Guarantees (other than guarantees to be demonstrated during the Reliability Test and plant startup/shutdown related...
guarantees) are being simultaneously achieved. Samples of the fuel used during the Thermal Performance Tests shall be taken before, during and on completion of the Thermal Performance Test. Three (3) separate samples shall be taken at each of the three sampling periods making nine samples in all. One of each set of three samples shall be fully analyzed by an independent authority approved by the Owners and the costs of these analyses shall be borne by Contractor. The other two samples of each set of three shall be properly labeled and one shall be delivered to Owners and the other to Contractor.

Performance Test results shall be corrected in accordance with ASME PTC 46, the manufacturer's performance correction curves, and the Contractor's correction curves to account for deviations from the Guarantee Conditions with the following exceptions:

- No tolerance or margin shall be applied to the Performance Test results when determining the achievement of the Performance Guarantees.
- Test uncertainties for the actual Performance Test results shall be calculated and compared to the values determined for the pretest uncertainty analysis in accordance with ASME PTC 19.1. Notwithstanding the calculation of actual test uncertainties, no test uncertainties shall be applied to the Performance Test results when determining the achievement of the Performance Guarantees.

Contractor shall select test instrumentation to minimize uncertainties such that the test measurement uncertainty shall not exceed a value of one half of one percent (0.5%) for the Performance Test for Net Electrical Output and one percent (1.0%) for the Performance Test for Net Heat Rate.

a. Net Facility Electrical Output

Net Electrical Output shall be determined at the high side of the STG and CTG step-up transformers. The revenue meters shall be utilized for net output determination. Auxiliary Equipment, lighting, and HVAC shall be operated as if in normal operation with fully redundant Equipment not in service. All normal operating air users shall not be shut off during the Performance Test.

b. General Requirements

During the Thermal Performance Test period the conditions shall be held as steady as possible compatible with safe and effective operation of the Facility.

The Performance Test load and operating conditions shall be maintained for one (1) hour after the termination of the Performance Test period and essential readings shall be taken to show that this requirement has been complied with.

c. Thermal Performance Test Requirements

(a) All heat rates shall be based on the Net Electrical Output.
(b) The gross electrical power output shall be measured at the terminals of the
generators.

(c) If Performance Test corrections are required for the following Equipment: a
generator, a generator step-up transformer, or UAT, then correction curves
derived from routine test results shall be used.

(d) If generator excitation is supplied by external means then the excitation power
shall be measured and deducted from the gross electrical power output.

(e) Suitable current and voltage transformers shall be provided by Contractor for the
measurement of auxiliary power. Current transformers shall be class 0.5 accuracy
and voltage transformers shall be class 0.2 accuracy according to IEEE 120
specifications.

(f) Contractor shall provide electrical measuring instruments to IEEE 120
specifications (accuracy class 0.2) for the measurement of auxiliary power
consumption.

(g) Contractor shall provide electrical meters for the measurement of auxiliary power
consumption.

(h) The means by which an average auxiliary load shall be determined for station
lighting and heating, and other intermittent power users shall be as approved by
Owners after a review of the Contractor's auxiliary load list.

(i) The power meters for the efficiency and output tests shall be provided by
Contractor. These meters (either combined active/reactive or separate active and
reactive) shall comply with the appropriate IEEE requirements for such high
accuracy meters. Discrete voltage and current transformers associated with the
power meters shall also be provided under by Contractor and shall comply with
the appropriate IEEE requirements for such high accuracy meters.

(j) Fuel calorific value measurements shall meet the requirements of the appropriate
ASME Power Test Code or Owners' approved equivalent.

(k) Any intended corrections applied to auxiliary load for changes in ambient
conditions, etc. shall be fully substantiated by Contractor to the reasonable
satisfaction of Owners.

4.2.2 Emissions

Emissions shall be measured by an independent testing service approved by Owners
during conditions and at output levels that shall satisfy the provisions of this Exhibit G and the
Agreement and use US EPA test methods to the extent specified in the air permit. Contractor
shall provide all labor (other than Owners' operators provided pursuant to Section 5.9 of the
Agreement), supervision, materials, equipment and services necessary to conduct the Emissions
Tests, including the independent testing service.

The Contractor shall develop a detailed air permit emissions compliance test protocol for
submission to the appropriate Governmental Authorities by the Owners. The protocol shall be
submitted to the Owners for approval at least four (4) months prior to the Performance Testing.
Contractor shall make all changes in the protocol that may be required to obtain approval from
each appropriate Governmental Authority.
Upon completion of the Performance Testing, the Contractor shall prepare an emission compliance test report for submittal to the appropriate Governmental Authorities by the Owners. A final compliance test report shall be submitted to the Owners within thirty (30) Days of completion of the compliance testing. Contractor shall be responsible for making any report modifications required for approval.

For all other Performance Tests, Contractor shall use the calibrated, certified, permanent Facility CEMS to demonstrate compliance with the Guaranteed Air Emissions.

4.2.3 Not Used.

4.2.4 Sound Performance

The Contractor shall verify through an approved Performance Test Procedure that the sound emissions associated with the Facility at full load are less than or equal to the Guaranteed Sound Emissions. Sound emissions from safety/relief valves and during start up, shutdown, and during upset conditions shall be excluded from the sound compliance requirements.

No tolerance or margin shall be applied to actual field measurements taken during any Performance Test when determining the achievement of the Guaranteed Sound Emissions. Measurement uncertainties may be applied to actual field measurements as provided in the applicable code when determining the achievement of the Guaranteed Sound Emissions.

a. Near Field Sound Test

The near field sound Performance Tests shall be conducted in accordance with:

ASME PTC-36, Measurement of Industrial Sound

ANSI/ASA S1.4, Standard Specification for Sound Level Meters

The near field sound test shall validate that the near-field A-weighted sound pressure levels at a distance of three (3) feet in the horizontal plane from the outermost surface of Equipment, including piping, conduit, framework, barriers, mitigation measures, personnel protection devices, curbs, and fluid retainer basins, and five (5) feet above grade comply with the Guaranteed Sound Emissions. Corrections for background sound, building effects, and free-field conditions may be applied in determining the sound pressure level. Near field levels shall be measured while Equipment is operating at base load, steady-state conditions, exclusive of transient events (including but not limited to startup and shutdown) and off-normal operating conditions (including but not limited to safety and relief valve operations).

b. Property Boundary (Far Field) Sound Limits

Property boundary sound testing shall be conducted in accordance with:

ASME PTC-36, Measurement of Industrial Sound

ANSI/ASA S1.4, Standard Specification for Sound Level Meters

ANSI S12.18, Procedures for Outdoor Measurement of Sound Pressure Level

Property boundary sound levels shall be measured to evaluate compliance with the Guaranteed Sound Emissions. Measurements shall include equivalent continuous A-weighted sound pressure levels at outdoor Cane Run Site boundary locations agreed between Contractor and Owners as appropriate for the Cane Run Site and the surrounding environment. Each measurement position shall be at a height of four (4) to five (5) feet from the ground surface and at a distance of at least three (3) feet from any additional reflecting surface. The mutually agreed measurement positions should be spaced along the property boundary including the position nearest to the Facility and other positions anticipated to produce the highest Facility sound levels.

Background sound levels shall be measured at the Cane Run Site boundary locations at a time when the project is not operating and during a time of day when ambient conditions are similar to those present during operation sound level measurements. If practical, background measurements shall be made before and after operation. The operational sound levels shall be corrected for background sound (in accordance with referenced standards) and averaged at the Cane Run Site boundary locations. The operational Cane Run Site boundary sound level shall be compared to the Guaranteed Sound Emissions to evaluate compliance.

Property boundary sound measurements are to be made during both day and night time periods which are defined as 0700 to 1900 and 1900 to 0700. All measurements shall be taken under quiescent conditions to minimize ambient sound levels. Measurements shall be made during Guarantee Base Conditions.

Measurements are to be reported as average A-weighted Leq sound levels (equivalent continuous A-weighted sound level, dBA), with optional percentile levels, for each measurement position. A map showing each measurement position shall be produced by Contractor and included in the Performance Test report.

4.2.5 Starting Reliability Test

The Starting Reliability Performance Test shall be run in conjunction with the Reliability Test to demonstrate achievement with the Guaranteed Starting Reliability over the duration of the Reliability Test. Determination of Starting Reliability shall be as defined by the following equation. Failure to satisfy this requirement shall result in a failure of the Reliability Test and the requirement to re-start the thirty (30) Day Reliability Test Period.

\[
SR = \left( \frac{SS}{SA} \right) \times 100\%
\]

Where:

- \( SR \) = Starting Reliability
- \( SS \) = The total number of successful Facility starts in which the breakers close and a preset load is reached within the applicable load ramp rate with no operator intervention.
- \( SA \) = The total number of Facility start attempts as indicated in the DCS. Any attempted start shall be counted.
Following satisfactory completion of all other Performance Guarantee Tests and achievement of Substantial Completion or Commercial Operation, the Facility shall be available for the thirty (30) day (“Guaranteed Reliability Period”) continuous reliability test (“Reliability Test”) during which time the Facility shall be operated by Owners' station operations staff, to demonstrate the Facility Equivalent Availability Factor. Contractor shall notify Owners at least one (1) Day in advance of starting the Reliability Test. The Facility shall operate in automatic control as a base control method with normal operating staff levels. The Facility shall operate during the Guaranteed Reliability Period at the dispatch loads requested by the dispatch authority within the Facility’s design capability. The applicable parameters shall be recorded for the Guaranteed Reliability Period.

Performance Test measurements during the Reliability Test shall be measured using permanent Facility instrumentation. Air emissions during the Reliability Test shall be measured using the calibrated permanent Facility CEMS. The Facility shall be required to operate with all auxiliaries under various operating modes as required by Owners. Operation may involve part load operation and shall be without failure or interruption of any kind during the entire Guaranteed Reliability Period.

During the Reliability Test, Contractor shall be allowed to make minor adjustments which may be necessary, provided that such adjustments do not in any way interfere with or prevent the commercial use of the Facility by Owners or result in a reduction in output, decrease of efficiency or exceeding of the Guaranteed Emissions. All adjustments made by Contractor shall be recorded by it in a manner to be agreed with Owners.

If a failure or interruption occurs in any portion of the Facility arising from Performance Test instrument malfunctions; failure of Equipment to meet operating requirements; faulty design; materials; workmanship; omissions; incorrect erection manufacturer's recommendations, or the Performance Test procedures, then the Reliability Test shall be considered void and the Reliability Test shall be recommenced after Contractor has remedied the cause of the failure or interruption.

Upon a Facility trip caused by the Work, the Reliability Test cannot be re-started unless the root cause of the trip has been identified and the problem has been corrected.

In the event the Facility fails to achieve the Guaranteed Reliability, the Reliability Test shall be discontinued and re-started. Contractor shall determine in advance the start of each Guaranteed Reliability Period and may not “look back” to determine an acceptable thirty (30) Day test period. It shall be Contractor's responsibility to alter or re-design the systems/Equipment until the Facility is capable of performing to the required standard. Any proposed changes shall be formally discussed and agreed with Owners before implementation.

Owners reserve the right to call for further Performance Tests until all Performance Test requirements are satisfied.

Periods where Guaranteed Emissions are exceeded shall be considered as a period of unavailability in the EAF calculation.
a. EAF Definition

The Equivalent Availability Factor ("EAF") shall be determined for the Facility by the following formula.

\[
EAF = \frac{AH - EDH}{PH} \times 100 \% 
\]

Where:

- **AH**: Available Hours (Period Hours (PH) less Planned Outage Hours (POH) and Forced Outage Hours (FOH))
- **EDH**: Equivalent Derated Hours
  - Equivalent Derated Hours are calculated as a sum, i.e.:
    \[
    \sum [(Size of Reduction) \times (No. of Hours Reduced)]
    \]
  - Size of Reduction is determined by:
    \[
    \frac{(NMC - NAC)}{NMC}
    \]
  - The No. of Hours Reduced for each derating and the NAC shall be taken from the DCS or the operator's log books.
- **PH**: The number of hours in the period
- **POH**: Sum of all hours experienced during planned outages of the Facility
- **FOH**: Sum of all hours experienced during forced outages of the Facility
- **NMC**: The Net Maximum Capacity of the Facility is the Net Electrical Output that the Facility can sustain over a specific period of time when not restricted by seasonal or other deratings. The NMC shall be set equal to the lesser of:
  - a) the Guaranteed Net Electrical Output,
  - b) the Net Electrical Output achieved in the last Performance Guarantee Test performed prior to the Reliability Test.
- **NAC**: The Net Available Capacity is the greatest Net Electrical Output at which the Facility can operate during the period of restriction caused by the derating.

"Reliability Test Interruption" means any period of time the Facility is out of service or de-rated because of factors external to Contractor's scope of work, including Force Majeure; unavailability of suitable fuel, water, oils, greases, chemicals, compressed gases, or reagents; faults of the electrical grid; outages or derates, either planned or forced, on the part of Owners; or failure of Owners to operate the Facility in accordance with the O&M Manuals. Reliability Test Interruptions shall be excluded from the Guaranteed Reliability Period for test data analysis and the Reliability Test shall continue when the interruption is corrected. Reliability Test Interruptions shall extend the Guaranteed Reliability Period by an amount of time equal to the interruption. Performance Test data collected before the interruption may be included in the analysis. The Reliability Test Interruption period shall include the periods of shutdown and startup associated with the Reliability Test Interruption event until the Facility is returned to normal operation.

Contractor shall collect the data required in order to determine the EAF during the Reliability Test. When the Facility is required for dispatch and a fault occurs resulting in a total loss of generation, the period of the forced outage shall begin when the Facility has been taken out of service such that it is no longer capable of being dispatched as evidenced by the operation...
A planned outage or a forced outage shall begin when the Facility has been taken out of service such that it is no longer capable of being dispatched by Owners as evidenced by the operation records and shall end when the Facility has been returned (in accordance with the start-up and ramp rates identified herein) to the pre-fault operating condition and dispatch.

Contractor shall have reasonable access to the Facility during the Reliability Test to inspect the Facility and all ancillary parts thereof. If as a result of such an inspection, Contractor becomes aware of abnormal operating conditions or an impending failure, the Facility shall be shut down in order to permit a detailed inspection over such period as Owners shall determine to be reasonable in the circumstances.

Upon the occurrence of a forced outage or derating, Contractor shall ensure that the Facility is returned to the required operating condition as soon as reasonably practicable. Contractor shall be responsible for all outages and load reductions caused by Contractor's scope of work during the Guaranteed Reliability Period, and all such outages and load reductions shall be accounted for in the EAF calculation.

4.3 FUNCTIONAL TESTS

Contractor shall demonstrate by the Functional Tests that systems and Equipment can achieve the performance required by the Agreement.

With Owners' prior written consent, some of the tests for parameters subject to Functional Tests may be completed during the Performance Guarantee Tests. In any case, the Functional Tests shall be satisfactorily completed as a condition of achieving Commercial Operation or Substantial Completion.

The following list of Functional Tests shall not be considered as being complete and exhaustive. The Functional Tests shall include such other tests as Owners may reasonably request.

4.3.1 Start-up Duration Test

Contractor shall perform a series of Functional Tests prior to the Commercial Operation Date or the date of Substantial Completion to demonstrate that the Facility can satisfactorily achieve the start-up times stated in Table 2.3 for Cold Start-ups, Warm Start-ups and Hot Start-ups. Initiation of start-up shall be the initial introduction of Fuel to the first CTG. Completion of start-up shall be the time at which the Guaranteed Net Electrical Output is achieved, without exceeding the maximum allowable STG ramp rate. Start of the Facility shall be demonstrated in accordance with the Performance Test Procedures. The demonstrations shall consist of a test to demonstrate each of the following:

Exhibit G – Guarantees and Performance Test Procedure
• Hot Start-up – After a Facility shutdown duration of at least ten (10) hours, the Facility shall reach one hundred percent (100%) of the Guaranteed Net Electrical Output within the time set forth in Table 2.3.

• Warm Start-up – After a Facility shutdown duration of sixty (60) hours or more, the Facility shall reach one hundred percent (100%) of the Guaranteed Net Electrical Output within the time set forth in Table 2.3.

• Cold Start-up – After a Facility shutdown duration of more than sixty (60) hours, the Facility shall reach one hundred percent (100%) of the Guaranteed Net Electrical Output within the time set forth in Table 2.3.

4.3.2 Ramp Rate Test

Contractor shall perform a series of Functional Tests prior to Commercial Operation or Substantial Completion to demonstrate that the Facility can satisfactorily achieve the Facility Ramp Rate between the Minimum Emissions Compliance Load and the Guaranteed Net Electrical Output.

The ramp rate test shall be performed after the Facility has been placed into service and the load stabilized. Tests shall be performed to verify the ramp rates both during loading and unloading of the Facility with both CTG's in operation and being ramped.

The duration of the ramp rate shall begin upon initiation of the ramp rate by the Owners and shall be completed when the Facility achieves the dispatched load condition requested by the Owners.

4.3.3 Workplace Sound Survey

Sound measurements, dB(A), shall be made during full load Facility operation throughout the Facility and at all positions normally occupied by personnel. A sound level meter conforming to the appropriate ANSI specifications or better shall be utilized. The measurement positions shall normally be at a height of five (5) feet above grade, foundation, platform, catwalk, or floor and at a minimum distance of three (3) feet from the system/Equipment surface. The number of measurement positions and their precise location shall be agreed by Contractor and Owners. The A weighted rms sound level using the slow response of the sound level meter shall be recorded at each position.

Alternatively the direct measurement of the equivalent continuous A-weighted sound pressure level may be made, at each measurement position, using an instrument complying with the appropriate ANSI specifications or better.

Instrument, calibration and measurement details not specified herein shall be determined from information given in the ANSI specifications.

Measurements shall be made during full load conditions and during other conditions as required by Owners. Sound levels greater than eighty (80) dB(A) shall be recorded to the nearest...
one (1) dB(A) and reported to Owners, and Contractor shall take such actions at the locations where such levels were encountered as are required by Exhibit A. For indoor spaces, the level shall also be measured at three (3) feet from the walls at all column lines, at the door of all elevators on all floors, and in all occupied spaces such as control rooms, offices, shops, and lockers. Roof top Equipment shall also be measured. For these locations, octave or one third (1/3) octave spectra are required in addition to “A” weighted overall values.

4.3.4 Operability Tests
Contractor shall operate the Facility under various operating conditions to validate the Facility’s ability to generate continuously at the following conditions or perform the following functions without unusual operator intervention, loss of component redundancy, or in a condition that may damage any component.

• Operation with one CTG out of service and the other CTG at full load. The Facility shall operate in a stable operating condition for 4 hours.
• Operation with one CTG out of service and the other CTG at Minimum CTG Emissions Compliance Load (tested on each CTG). The Facility shall operate in a stable operating condition for 4 hours.
• Shutdown and restart of either CTG with the other CTG remaining at full load.
• Shutdown and restart of the STG with both CTG’s remaining in service with runback from full load.

4.3.5 Raw Water Treatment System Test
Contractor shall demonstrate that the raw water treatment system is able to produce treated water at one hundred percent (100%) design flow capacity at the specified water quality while maintaining the expected regeneration rates.

Variation in the influent water quality is expected and the treatment system effluent shall meet the guaranteed water quality regardless of variations in influent. The net throughput per backflush/regeneration and backflush/regeneration frequency shall be adjusted to compensate for significant variation in influent water analysis.

The system effluent analysis as sampled at the effluent sample line of the pre-treatment system shall not exceed the following water chemistry. System effluent samples shall be taken at 10, 20, 40, 60, 90, and 100 percent of the metered run of the system requiring the most frequent backflush/regeneration. To successfully pass the test, all samples shall satisfy the water chemistry requirements noted below. The samples shall be analyzed by Contractor, with Owners also having the right to analyze the sample. The test shall be run at both the maximum and minimum flow conditions, with the system controls in the normal automatic mode.

<table>
<thead>
<tr>
<th>Raw Water Treatment System Effluent Quality Parameter</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Suspended Solids</td>
<td>mg/L</td>
<td>&lt; 1.0</td>
</tr>
</tbody>
</table>

Exhibit G – Guarantees and Performance Test Procedure
4.3.6 Cycle Makeup Water Treatment System Test

Contractor shall demonstrate that the cycle makeup water treatment system is able to produce treated water at one hundred percent (100%) design flow capacity at the specified water quality.

Variation in the influent water quality is expected and the demineralizer effluent shall meet the guaranteed water quality regardless of variations in influent.

The system effluent analysis as sampled at the effluent sample line of the demineralization system shall not exceed the following water chemistry or such more restrictive water chemistry as required by the HRSG or STG supplier. System effluent samples shall be taken at 10, 20, 40, 60, 90, and 100 percent of the metered run of each exchanger. To successfully pass the test, all samples shall satisfy the water chemistry requirements noted below. The samples shall be analyzed by Contractor, with Owners also having the right to analyze the sample. The test shall be run at both the maximum and minimum flow conditions, with the system controls in the normal automatic mode.

<table>
<thead>
<tr>
<th>Cycle Makeup Treatment System Effluent Quality Parameter</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Conductivity</td>
<td>μS/cm at 25°C</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Total Silica</td>
<td>µg/L as SiO₂</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Sodium</td>
<td>µg/L as Na</td>
<td>&lt;3</td>
</tr>
<tr>
<td>Sulfate</td>
<td>µg/L as SO₄</td>
<td>&lt;3</td>
</tr>
<tr>
<td>Chloride</td>
<td>µg/L as Cl</td>
<td>&lt;3</td>
</tr>
<tr>
<td>Total Organic Carbon (TOC)</td>
<td>µg/L as C</td>
<td>&lt;300</td>
</tr>
</tbody>
</table>

5.0 DEMONSTRATION TESTS

5.1.1 Cooling Tower Performance Test

The Cooling Tower Performance Test shall verify the ability of the cooling tower to maintain the summer day cold water temperature during full load operation at the Guarantee Base Conditions. Performance shall be verified at full circulating water flow rate and with all fans in operation. This Demonstration Test may be completed after Commercial Operation (but prior to Final Completion) if ambient conditions do not allow testing prior to Commercial Operation or Substantial Completion.

5.1.2 Evaporative Cooler Effectiveness Test

Contractor shall perform a test to demonstrate the effectiveness of the evaporative cooler. Such test shall be run at a condition as near to the Guarantee Base Conditions as possible. To the extent that the evaporative cooler cannot be sufficiently operated prior to Commercial Operation...
for substantial completion due to low ambient temperatures, this demonstration test may be performed after commercial operation or substantial completion but shall be completed prior to final completion.

The evaporative cooler effectiveness test shall be performed to validate the ability of each CTG inlet evaporative cooler to reduce the compressor inlet temperature by eighty-five percent (85%) of the difference between the ambient dry bulb temperature and the coincident wet bulb temperature. This demonstration test shall be performed with the CTG at full load.

6.0 PERFORMANCE TEST RESULTS

Contractor shall submit to Owners four (4) months prior to the anticipated commencement of the performance guarantee tests, the methodology by which it proposes to calculate the results based on the measured data.

Prior to the calculation of the performance test results, Contractor shall obtain Owners' agreement that the performance tests were properly conducted and that the fundamental data obtained from the performance tests are accurate.

Preliminary corrected performance figures shall be calculated at the completion of each performance test to allow Owners to determine if the performance test completed was satisfactory or whether it should be repeated.

A preliminary report of all the performance tests shall be produced and three (3) copies issued to Owners for approval within forty-eight (48) hours of the completion of each performance test.

After completion of the performance tests, Contractor shall provide, within fourteen (14) days, all calculations and diagrams for each performance test covering all load conditions tested.

The form of calculation sheets and diagrams, which shall conform to the format approved by Owners, shall clearly identify the values measured in the performance test.

A final, full and complete report of all the performance tests shall be produced and three (3) copies issued to Owners for approval within thirty (30) days of the completion of the performance tests. The final performance test reports shall include, as a minimum, the following details:

1. Date and time of test start and finish,
2. Full procedure adopted,
3. Instrumentation details and calibration data including signed and approved instrument calibration forms,
4. Full schematic of the fuel, steam and feed systems together with instrument locations,
5. The standard to which the performance test was carried out and the codes followed, plus the steam tables and other reference data used.
6. The operating conditions prior to the Performance Tests,
7. Variations in system frequency/turbine speed,
8. Summary of Performance Test readings, results and conclusions
9. Full heat balance calculation data sheets and heat balance diagrams for the 'As-Run' and 'Corrected As-Run' conditions, and the 'Fully Corrected As-Run' conditions for the Performance Test.
10. Laboratory analyses and calculations,
11. Pre-test uncertainty calculations,
12. Copies of Performance Test data sheets or other raw data,
13. Notes on any unusual observations, data or conclusions,
14. Attendance
15. Results of the Performance Test.