

**Iatan Unit 2 In-Service Test Criteria**  
**As Required by Kansas Corporation Commission, and**  
**In Accordance with Section G, Paragraph 3, Appendix C of the**  
**Stipulation and Agreement**  
**Docket No. 04-KCPE-1025-GIE**

1. Unit must demonstrate that it can operate at its design minimum load (340 MWnet).

Hours at design minimum load / 400 hours  $\geq$  0.80

2. Unit must be able to operate at or above its design capacity factor for a reasonable period of time. If the design capacity factor is not specified it will be assumed to be 60% unless the utility can offer evidence justifying a lower value.

Design capacity factor  $\leq$  energy generated (in MW hours) for a continuous period of 168 hours / (design full load [850 MWnet] x 168 hours)

3. Unit must operate at an average capacity equal to 98% of its design maximum continuous rating [850 MWnet] for four (4) hours.

4. Unit must be operated so as to show a clear and obvious trend toward the predominate use of coal as its primary fuel. Test period will be thirty (30) days. The following items will be used as an indication of the trend for coal operation:

- a) Boiler control tuning completed such that the unit can operate safely with all control systems in auto.
- b) Ash build up in the furnace and back-pass areas shall be monitored and be within expected levels.
- c) All boiler/turbine interlocks shall be proven to work as designed.
- d) Soot-blowing timing and sequences shall be set properly to clean the tube areas.
- e) All critical alarms brought into the control room shall be operational and functioning properly.
- f) At the end of the test period, oil burn levels, if applicable, will be at or near design levels while burning coal.

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- g) Oil igniters are functioning in accordance with specifications.
- h) Coal handling systems, from rail car unloading to pulverizers, are capable of supplying primary fuel for sustained operation during the testing period.

5. The Unit shall be operational and ~~must~~ demonstrate its ability to operate at ~~that it~~ has a heat rate within five percent (5%) of the design level of approximately 9,100 btu/kWh over a continuous four (4) hour period. This should be performed using a four hour input/output test in which coal consumption (btu) and output kWh are measured. The utility shall provide an explanation and corrective action plan to the Commission Staff in the event the results exceed ~~Should the results be above the 105% level, an explanation and plans for correction should be provided. To the satisfaction of KCC representatives.~~

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6. Unit must have successfully completed all major equipment startup test procedures. For purposes of this paragraph, major equipment includes: steam generator, turbine-generator, cooling tower/circulating water system, boiler feed pump(s), coal receiving/handling equipment, pulverizers, ash-handling equipment, condensate and feedwater systems, combustion air systems, flue gas systems, on-site electrical distribution system, instrumentation and controls systems (including distributed control system), and chemical storage/transfer systems.

7. All major equipment operates satisfactorily to support compliance with in-service criteria 1 through 4 (as listed above). For purposes of this paragraph, major equipment includes: steam generator, turbine-generator, cooling tower/circulating water system, boiler feed pump(s), coal receiving/handling equipment, pulverizers, ash-handling equipment, condensate and feedwater systems, combustion air systems, flue gas systems, on-site electrical distribution system, instrumentation and controls systems (including distributed control system), and chemical storage/transfer systems.

8. Sufficient transmission interconnection facilities shall exist for the total plant design net electrical capacity at the time the newest unit is declared fully operational and used for service.

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9. Sufficient transmission facilities shall exist for KCPL's share of the total plant design net electrical capacity from the generating station into the KCPL service territory at the time the newest unit is declared fully operational and used for service.

10. Equipment installed to comply with emission requirements shall be operational and demonstrate the ability to remove 93% or more of the NO<sub>x</sub>, SO<sub>2</sub>, particulate, and mercury emissions they were installed to remove over a continuous four (4) hour period while operating at or above 95% of its design load. This equipment shall also be required to demonstrate that it is able to remove 88% or more of these same emissions it was installed to remove over a continuous 120 hour period while operating at or above 80% of its design load.

11. Emissions Control Equipment. The utility and the Commission Staff agree that the in-service testing requirements of this Paragraph are equivalent to the performance criteria stated in Paragraph ~~109~~ above ~~and contained in the Stipulation~~.<sup>1</sup> Each equipment system as set forth in Subparagraphs (a) – (d) below shall be evaluated for successful completion of in-service testing on an individual basis. The failure of the utility to achieve the emissions or removal limits specified in the in-service testing for a given system will not impact the utility's ability to include all systems demonstrated to meet the applicable emissions or removal limits in the utility's rate recovery regulatory proceeding for Iatan Unit 2.

a) NO<sub>x</sub> Control Equipment

- i. All major construction work is complete.
- ii. All preoperational tests have been successfully completed.
- iii. Equipment successfully meets the operational contract guarantees necessary to achieve the emission levels described in subparagraphs ~~110~~(a)(iv) and ~~110~~(a)(v) below.

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<sup>1</sup> Paragraph ~~110~~ identifies the criteria and emissions/removal testing that will demonstrate the utility's achievement of the criteria contained in Paragraph ~~109~~. ~~The language of Paragraph 9 is also contained in the Stipulation.~~—The utility and Staff calculated the numerical values and/or percentages contained in Paragraph ~~110~~ from the Iatan Unit 2 design limits for each of the major components of the AQCS equipment and the emissions percent or rate of removal requirements for the testing described in Paragraph ~~109~~ and the ~~Stipulation~~. A chart summarizing the testing requirements is contained in the attached Appendix A.

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- iv. The equipment shall be operational and demonstrate its ability to operate at a NO<sub>x</sub> emission level of less than or equal to 0.054 lb/mmBtu over a continuous four (4) hour period while the generating unit is operating at or above 95% of its design load (850 MWnet).
  - v. The equipment shall also demonstrate its ability to operate at a NO<sub>x</sub> emission level of less than or equal to 0.057 lb/mmBtu over a continuous 120-hour period while the generating unit is operating at or above 80% of its design load (850 MWnet).
- b) SO<sub>2</sub> Control Equipment
- i. All major construction work is complete.
  - ii. All preoperational tests have been successfully completed.
  - iii. Equipment successfully meets the operational contract guarantees necessary to achieve the emission levels described in subparagraphs 110(b)(iv) and 110(b)(v) below.
  - iv. The equipment shall be operational and demonstrate its ability to operate at a SO<sub>2</sub> reduction efficiency equal to or greater than 91% over a continuous four (4) hour period while the generating unit is operating at or above 95% of its design load (850 MWnet).
  - v. The equipment shall also demonstrate its ability to operate at a SO<sub>2</sub> reduction efficiency equal to or greater than 86% over a continuous 120-hour period while the generating unit is operating at or above 80% of its design load (850 MWnet).
- c) Particulate and Opacity Control Equipment
- i. All major construction work is complete.
  - ii. All preoperational tests have been successfully completed.
  - iii. Equipment successfully meets the operational contract guarantees necessary to achieve the emission levels described in subparagraphs 110(c)(iv) and 110(c)(v) below.
  - iv. The equipment shall be operational and demonstrate its ability to operate at a stack opacity (six minute average) less than or equal to 11% over a continuous four (4) hour period while the generating unit is operating at or above 95% of its design load (850 MWnet).

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- v. The equipment shall also demonstrate its ability to operate at a stack opacity (six minute average) less than or equal to 11.5% over a continuous 120-hour period while the generating unit is operating at or above 80% of its design load (850 MWnet).

d) Mercury Removal Equipment

- i. All major construction work is complete.
- ii. All preoperational tests have been successfully completed.
- iii. Equipment successfully meets the operational contract guarantees necessary to achieve the emission levels described in subparagraphs 110(d)(iv) and 110(d)(v) below.
- iv. The equipment shall be operational and demonstrate its ability to operate at a mercury emission level of less than or equal to 1.61 lb/trillion Btu over a continuous four (4) hour period while the generating unit is operating at or above 95% of its design load (850 MWnet).
- v. The equipment shall also demonstrate its ability to operate at a mercury removal level of less than or equal to 1.70 lb/trillion Btu over a continuous 120-hour period while the generating unit is operating at or above 80% of its design load (850 MWnet).

e) Continuous Emissions Monitoring System

- i. Continuous emission monitoring systems (CEMS) are operational and demonstrate the capability of monitoring the emissions to satisfy the parameters in Paragraph 110.

## APPENDIX A

<b>Parameter</b>	<b>Unit 2 Design Emissions/Removal Criteria per Vendor Contract Documents</b>	<b>4 hour test: 93% Emissions/Removal of Design Criteria at 95% of Design Load (850 MW net)</b>	<b>120 hour test: 88% Emissions/Removal of Design Criteria at 80% of Design Load (850 MW net)</b>
<b>NO<sub>x</sub></b>	Emissions ≤ 0.050 lbs/mmBtu	Emissions ≤ 0.054 lbs/mmBtu	Emissions ≤ 0.057 lbs/mmBtu
<b>SO<sub>2</sub></b>	Removal ≥ 98% removal	Removal ≥ 91%	Removal ≥ 86% removal
<b>Particulate and Opacity</b>	Emissions ≤ 10% emissions	Emissions ≤ 11%	Emissions ≤ 11.5%
<b>Mercury</b>	Emissions ≤ 1.50 lbs/trillionBtu	Emissions ≤ 1.61 lbs/trillionBtu	Emissions ≤ 1.70 lbs/trillionBtu

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