GENERATOR TESTING PROCEDURES

1.0 PURPOSE

1.1 Explanation of Requirements

KPP Energy members receive transmission service under the Southwest Power Pool (SPP) tariff. Under this transmission service KPP Energy member generation is used to provide needed capacity to assure reliable service both to KPP Energy members and other users of SPP transmission service. Section 7.1 of the SPP criteria[1] addresses how users of SPP transmission service must rate their generating capability and how they must verify that capability by periodic testing. As a customer of SPP transmission service, KPP Energy must annually report the ratings of member generation to SPP. KPP Energy members that own generation are responsible for establishing and testing their generation capability per this procedure.

1.2 Rating of Generating Capability

The SPP criteria require that generation capability be verified by testing. The results of generation capability testing will be used to provide updated ratings of generation capacity. Generators may not have a rated capability greater than the net generator capability recorded during the most recent valid Generation Capability Test. The Generation Capability Test Verification Worksheet is attached as Appendix 1.

1.3 Verifying Operability of Generation

The SPP criteria require that each generating unit be tested periodically to demonstrate the ability to achieve its nominal generating capability. The Generation Operability Test Verification Worksheet is attached as Appendix 2.

1.4 Generation Capacity for Purposes of KPP Energy Capacity Payments

KPP Energy policy reimburses members for their generation capacity based on the capacity testing requirements in the Southwest Power Pool (SPP) planning criteria. These payments are based on the results of unit capability and operability tests that meet the requirements of this procedure.

[1] SPP Planning Criteria v4.4

2.0 SCOPE

This procedure is applicable to all KPP Energy members who own and operate generating units. Testing results for KPP Energy generators considered Designated Network Resources (DNRs), under the SPP transmission service to KPP Energy, will be reported to SPP as required. The results for these DNR units will also be used by KPP Energy for resource planning and decisions regarding future generation resources.

3.0 RESPONSIBILITY

It is the responsibility of the KPP Energy Members to conduct the required testing for their generating units.

4.0 Frequency of Testing

4.1 Generation Capability Test

SPP criteria require that Generation Capability Testing occur at least once every 5 years during the SPP summer period (the months of June through September) at or above a minimum design temperature no more than 10^{o} below ASHRAE Rated Ambient Temperature.[1] Because it may be occasionally difficult to meet test condition requirements during unusually cool summers, members may elect to perform a Generation Capability Test on its generating units more frequently (for example every year or every three years). In addition to the required Generation Capability Test frequency of once every five years, the SPP criteria also require that testing be performed if any unit undergoes a physical or operational modification which could affect generator capability. Should the unit undergo such modifications, the member must perform the Generation Capability Test for that unit as soon as practical, given appropriate summer conditions.

4.2 Generation Operability Test

SPP criteria require that Generation Operability Testing occurs every year at a minimum of 90% of the generation capability rating as established by the last valid capability test. This test may be performed at any time during the year but must be performed annually. SPP criteria also allows for use of any normal generator operation that meets the test duration and criteria to be used instead of the Generation Operability Test. If a Generation Capability Test is performed it is sufficient in meeting the Generation Operability Test requirement for that summer testing season.

[1] American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) Fundamentals Handbook rated design temperature for the location of the generator. These minimum temperature requirements are shown in Table 2.

4.3 Seasonality of Generation Testing

KPP Energy load peaks during the summer period. Generation Capability Testing is required to be performed during the summer period. The summer period is defined by SPP as during June, July, August, and September. Capability Testing is required to be performed during these months. Operability Testing may be performed any time of year. SPP requires that each unit used for generation capacity must meet the annual operability, or if due, capability, test requirements.

Table 1 Summary of Test Frequency Requirements

Test	Required Frequency	Recommended Frequency	Additional Testing	Notes
Generation Capability Test	Every 5 years in the summer	Every 3 years	Following modifications that affect capability	Used to determine Capacity Rating and Capacity Payments
Generation Operability Test	Every year any season	N/A	N/A	Can use any hour of normal operation that meets test requirements. Not required the same year as capability test.

5.0 PROCEDURE/METHODOLOGY

5.1 Generation Capability Test

(Use Generation Capability Test Verification Worksheet, Appendix 1)

5.1.1 Scheduling

Notify KPP Energy scheduling as soon as practical prior to performing testing, preferably, provide notification prior to 8 AM the day before the test is to be performed. Members should bill KPP Energy for generation costs related to testing.

5.1.1.1

For KPP Energy scheduling notification contact Tenaska at (817) 462-1509 and email at KPP Energy@tnsk.com and gentest@kpp.agency .

5.1.1.2

Bill KPP Energy for generation costs at gencost@kpp.agency .

5.1.2 Settling Period (Steam Units Only)

Steam units must generate within 5% of their rated capability during a settling period prior to the Generation Capability Test. During the settling period only minor changes in unit controls shall be made to bring the unit into normal, steady-state operation. The settling period shall be at least 2 hours for steam units rated greater than 100 MW. The settling period shall be at least 1 hour for steam units rated less than 100 MW. A settling period is NOT REQUIRED for all other types of units.

5.1.3 Test Period

The test period shall be 1 hour.

5.1.4 Test Conditions

Generation Capability Testing shall be performed during the months of June, July, August, or September, the summer season, when ambient temperatures are within 10 degrees Fahrenheit of rating dry-bulb temperature. The minimum testing ambient temperatures for each KPP Energy member are shown in Table 2.

Table 2. Minimum dry-bulb ambient test temperature

KPP Energy Generating City	Minimum Dry-Bulb Ambient Test Temperature (in degrees Fahrenheit)
Attica	92.5
Augusta	89.7
Burlington	87.5
Clay Center	89.6
Ellinwood	89.8
Erie	88.4
Kingman	91.1
Minneapolis	91.3
Mulvane	89.7
Oxford	90.3
Wellington	90.3
Winfield	90.3

5.1.5 Simultaneous Testing Requirements

Where generating units are dependent upon common systems such as fuel systems, cooling systems, auxiliary power system, etc., the total output of the dependent units shall be tested simultaneously.

5.1.6 Testing Assistance

KPP Energy members are expected to perform testing to comply with requirements. Witnessing Generation Capability Testing is not required. However, if a member would like help or assistance performing testing, they may contact KPP Energy.

5.1.7 Data that Must be Recorded

SPP criteria requires the following data to be recorded during the Generation Capability Test:

- Meteorological data (may use site data or nearest official weather station)
  - Dry-bulb temperature
  - Barometric pressure
  - Wet-bulb temperature (may record relative humidity instead)
- Condenser cooling water inlet temperature (Steam units only)
- Generation Output
  - Net Generation
    - Can be calculated by subtracting auxiliary load from gross generation
  - Gross Generation
    - Can be calculated by adding auxiliary load to net generation
  - Auxiliary Load
    - If this is not individually metered it may be calculated based upon vendor information, measurement of station power before and after testing, or using data from similar units.

5.1.8 Submission of Test Data

Submit completed Generation Capability Test Verification Worksheet, along with any supporting test data to KPP Energy via mail, email (gentest@kpp.agency), or fax (888) 431-4943.

5.2 Generation Operability Test

(Use Generation Operability Test Verification Worksheet, Appendix 2)

5.2.1 Scheduling

Notify KPP Energy scheduling as soon as practical prior to performing testing, preferably, provide notification prior to 8 AM the day before the test is to be performed. Members should bill KPP Energy for generation costs related to testing.

5.2.1.1

For KPP Energy scheduling notification contact Tenaska at (817) 462-1509 and email at KPP Energy@tnsk.com and gentest@kpp.agency .

5.2.1.2

Bill KPP Energy for generation costs at gencost@kpp.agency .

5.2.2 Test Period

The test period shall be 1 hour for all units

5.2.3 Test Conditions

Generation Operability Tests shall be performed annually unless a capability test is performed. There are no minimum ambient conditions required for the testing. However, it is recommended that ambient dry-bulb temperature be recorded.

5.2.4 Substitution of Actual Generator Operation

Any normal hour of unit operation that is 90% or more of the units verified generation capability rating, may be substituted for the Generator Operability Test, provided that the Generator Operability Test Verification Worksheet in Appendix 2 is completed and submitted.

5.2.5 Submission of Test Data

Submit completed Generation Operability Test Verification Worksheet, along with any supporting test data to KPP Energy via mail, email (gentest@kpp.agency), or fax (888) 431-4943.

6.0 Exercising of Member Generation Assets (Maintenance & Training Runs)

6.1 Reciprocating Engine Units

6.1.1 Exercising Frequency

- Up to eleven (11) times per year
- Up to four (4) hours per run

Members are encouraged to exercise units at least three (3) times per year

6.1.2 Scheduling & Reimbursement

Notify KPP Energy scheduling as soon as practical prior to performing the exercising run, preferably, provide notification prior to 8 AM the day before the exercise run is to be performed.
For KPP Energy scheduling notification contact Tenaska at (817) 462-1509 and email kpp@tnsk.com and gentest@kpp.agency .

6.1.3 Compensation & Billing

KPP Energy will compensate the members for reciprocating engine fuel cost when exercising units.

Members should bill KPP Energy for fuel cost associated with the exercise run, submitting to gencost@kpp.agency.

6.2 Steam and Gas Turbine Units

6.2.1 Exercising Frequency

Steam and Gas Turbines can be exercised as needed, provided units are not dispatched in the SPP Integrated Market frequently enough to adequately train personnel.

6.2.2 Scheduling & Reimbursement

Members should contact KPP Energy if market dispatch is not sufficient to exercise units or for staff training needs, and a member desires fuel cost recovery for additional operation.

Notify KPP Energy scheduling as soon as practical prior to performing the exercising run, preferably, provide notification prior to 8 AM the day before the exercise run is to be performed.
For KPP Energy scheduling notification contact Tenaska at (817) 462-1509 and email kpp@tnsk.com and gentest@kpp.agency.

6.2.3 Compensation & Billing

KPP Energy will compensate members for steam and gas turbine fuel costs when exercising units.

Members should bill KPP Energy for fuel cost associated with the exercise run, submitting to gencost@kpp.agency