

Previous Testimony of
David W. Elliott

- 1) ER-94-163, St. Joseph Light & Power Co.
- 2) HR-94-177, St. Joseph Light & Power Co.
- 3) ER-94-174, The Empire District Electric Co.
- 4) ER-95-279, The Empire District Electric Co.
- 5) EM-96-149, Union Electric Co.
- 6) ER-99-247, St. Joseph Light & Power Co.
- 7) EM-2000-369, UtiliCorp United, Inc. and The Empire District Electric Co.
- 8) ER-2001-299, The Empire District Electric Co.
- 9) ER-2001-672, Utilicorp United, Inc.
- 10) ER-2002-424, The Empire District Electric Co.
- 11) ER-2004-0034, Aquila, Inc.

In-service and Construction Audit activities of David W. Elliott

- 1) In-service review and testimony for Empire State Line Combined Cycle Unit.
- 2) Construction audit and testimony for Empire State Line Combined Cycle Unit.
- 3) Preliminary in-service review and preliminary construction audit review for KCPL Hawthorn Units 5, 6, 7, 8, and 9.
- 4) Preliminary in-service review and preliminary construction audit review for KCPL West Garner Units 1,2,3, and 4.
- 5) Preliminary in-service review and preliminary construction audit review for KCPL Osawatomie Unit 1.
- 6) Preliminary in-service review and preliminary construction audit review for AmerenUE Meremac combustion turbine.

Summary of in-service test criteria
developed by the
Missouri Public Service Commission Staff

Callaway

Union Electric

Nuclear unit, new installation

Case No. ER-84-168/EO-85-17

1. Startup testing program successfully completed.
2. Pre-operational test program successfully completed.
3. Plant and transmission facilities tested for capability of supplying Missouri customer's full share of rated power with most critical transmission line out of service.
4. All licenses, which are needed to operate at full power, have been issued or acceptable commitments obtained.
5. Plant is operating and the NRC compliance history shows evidence of Company competence.
6. Exemptions from criteria #5 may be granted or the plant is "fully operational" at power level less than the rated full power for good cause.
7. Plant is supplying electricity to the company's system with output scheduled by the system load dispatcher.

Wolf Creek

Kansas City Power & Light Co.

Nuclear unit, new installation

Case No. EO-85-185/ER-85-128

1. Startup test program successfully completed
2. Pre-operational test program successfully completed
3. Plant and transmission facilities tested for full capability with one critical line out of service.
4. All licenses required to operate at full power have been issued or acceptable commitments obtained.
5. The plant is operating and the NRC compliance history shows evidence of competence.
6. For good cause exemptions from criteria #5 may be granted at some power level less than rated power originally proposed.
7. The plant output is supplying electricity to KCPL Missouri customers with output scheduled by the KCPL load dispatcher, subject to plant availability.

Iatan

Kansas City Power & Light Co., St. Joseph Light & Power Co., The Empire District Electric Co.

Coal unit, new installation

Case No. ER-81-42

1. Unit must demonstrate that it can operate at its design minimum power or above, continuously for at least 80% of 400 hours.
2. Unit must be able to operate at or above its design capacity factor for a period of time of 168 continuous hours.
3. Unit must operate at a capacity equal to 95% of its nameplate rating for 4 hours.
4. Unit must be operated for 30 days so as to show a clear and obvious trend toward the predominate use of coal as its primary fuel.
5. Unit must have finished the startup test program with all startup test procedures necessary for operation satisfactorily completed.
6. Sufficient transmission facilities shall exist to carry the total design net electrical capacity from the completed generating station into the system at the time the unit is declared fully operational and used for service.

Jeffrey Energy Center Unit #1

Missouri Public Service Co.

Coal unit, new installation

Case No. ER-79-60

1. Operating at its minimum level consistently.
2. Operation at expected load factor.
3. Operation at nameplate capacity.
4. Reliance upon its designed energy input.
5. Completion of testing.

Jeffrey Energy Center Unit #2

Missouri Public Service Co.

Coal unit, new installation

Case No. ER-80-231

1. Unit must demonstrate that it can operate at its design minimum power or above, equal to 80% of 400 hours.
2. Unit must be able to operate at or above its design capacity factor for a period of 168 hours. (capacity factor = 0.6 unless Company offers evidence otherwise)
3. Unit must operate at a capacity equal to 95% of its nameplate rating for 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.
5. Unit must have finished the startup test program with all startup test procedures necessary for operation satisfactorily completed.

The foregoing five criteria are interdependent and all must be satisfied before JEC-2 can be declared fully operational and used for service and thus a proper rate base addition.

Jeffrey Energy Center Unit #3

Missouri Public Service Co.

Coal unite, new installation

Case No. ER-83-40

1. Unit must demonstrate that it can operate at its design minimum power or above, equal to 80% of 400m hours.
2. Unit must be able to operate at or above its design capacity factor for a period of 168 hours. (capacity factor = 0.6 unless Company offers evidence otherwise)
3. Unit must operate at a capacity equal to 95% of its nameplate rating for 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.
5. Unit must have finished the startup test program with all startup test procedures necessary for operation satisfactorily completed.
6. Sufficient transmission facilities shall exist to carry the total design net electrical capacity from the completed generating station into the system at the time the unit is declared fully operational and used for service.

Sibley

Missouri Public Service Co.

Coal unit, fuel switch

Case No. ER-93-37

1. Compliance with environmental regulations.
2. Blending, and burning a blend, of two low sulfur western coals.
3. Showing consistency in carrying minimum load while burning the blend.
4. Showing the ability to operate at nameplate capacity while burning the blend.
5. Showing ability to operate at historical capacity factors while burning the blend.

State Line No. 1

The Empire District Electric Co.

Natural gas and oil unit, new installation

Case No. ER-95-279

State Line No. 2

The Empire District Electric Co.

Natural gas and oil unit, new installation

Case No. ER-97-81

1. All construction and pre-operational testing shall have been completed. This shall be determined through:
 - a) Physical inspection conducted by a member or members of the Missouri Public Service Commission Staff,
 - b) The Company's plant manager attesting to the fact that all pre-operational testing has been successfully completed in accordance with written test procedures, and
 - c) Establishment that all liability for final payment of equipment and construction contracts is recorded on the books.
2. The generating unit shall demonstrate its ability to start when prompted only by a signal from a remotely located control center. Once burning natural gas and once while burning distillate oil.
3. The generating unit shall demonstrate its ability to smoothly and successfully shutdown when prompted only by a signal from a remotely located control center.
4. The generating unit shall demonstrate its ability to accept load increase from zero MW to 40 MW within ten minutes, starting from the cold, zero rpm condition.
5. The generating unit shall demonstrate its ability to accept load increase from zero megawatts to Base Capacity within twenty-two minutes, starting from the zero rpm condition. This twenty-two minute test period may include the ten minute ascension test to 40 MW, if the Company elects to integrate the two tests, or alternately the twenty-two minute test can be run as a separate test.
6. While burning natural gas, the generating unit shall run continuously for one hour at or above Peak Capacity to demonstrate maximum capability.
7. While burning natural gas, the generating unit shall run continuously for four hours at or above Base Capacity. (Bonus-penalty correction factor is calculated if unit exceeds or fails to meet Base Capacity for four hours.)

8. While burning natural gas and operating at the Base Capacity condition, the generating unit shall achieve the warranted heat rate. (Bonus-penalty correction factor is calculated if unit exceeds or fails to meet warranted heat rate.)
9. While burning natural gas and operating at the Base Capacity condition with an exhaust gas flow of a determined actual cubic feet per minute, the generating unit shall achieve the warranted NOx emission level. (Bonus-penalty correction factor is calculated if unit exceeds or fails to meet warranted NOx emission level.)
10. The generating unit shall demonstrate consistency in its ability to operate at or above a pre-defined minimum load by running for three days (72 hours) at or above 20 MW while under control of the system dispatcher. This test shall be conducted while burning natural gas, except that a transition to distillate oil shall be made sometime during the three-day period, after which, for an eight (8) hour period, only distillate oil shall be burned. A transition back to natural gas shall be made following the eight-hour oil burn and stabilization shall be achieved on natural gas before shutdown. The transition from natural gas to distillate oil fueling shall be made while the unit is in operation. If the unit drops below 20 MW when the fuel transition is made, then credit will be given for successfully testing on natural gas, if successfully completed previously, and an extended rerun on natural gas will not be necessary before attempting the transfer to oil. However, the rerun must be started on gas, followed by a successful transition to distillate oil, an 8 hour run on oil, and transfer back to natural gas. If the Company elects, The four hour Base Capacity and the one hour run at Peak Capacity can be included in this 72 hour run to demonstrate consistency in holding minimum load.

The Base Capacity and Peak Capacity were defined.
Total cumulative bonus factors used to offset any cumulative penalty factors.

State Line Combined Cycle Unit

The Empire District Electric Co.

Natural gas combined cycle unit, new installation

Case No. ER-2001-299

1. Major construction work, and pre-operational tests have been successfully completed such that the Combined Cycle Unit may be operated and successfully complete criteria items 2 through 7.
2. All contract performance guarantee testing will be successfully performed in accordance with the contracts for the new Siemens-Westinghouse Combustion Turbine, the new Siemens-Westinghouse steam turbine, and the new Nooter/Eriksen Heat Recovery Steam Generators.
3. The Combined Cycle Unit will demonstrate its ability to startup from turning gear operation to nominal capacity on natural gas fuel when prompted by the operator.
4. The Combined Cycle Unit will demonstrate its ability to shut down from minimum load resulting in turning gear operation when prompted by the operator.
5. The Combined Cycle Unit will demonstrate its ability to operate at minimum load for one hour on natural gas fuel.
6. The Combined Cycle Unit will demonstrate its ability to operate at or above 95% of nominal capacity for four continuous hours on natural gas fuel. During this test the unit will demonstrate its ability to operate at or above 98% of its nominal capacity for one hour.
7. The Combined Cycle Unit will demonstrate its ability to produce an amount of energy (Mwhr) within a 168 hour period that results in a capacity factor of at least 48.3 % during the period.
8. Sufficient transmission facilities shall exist to carry the total design net electrical capacity of the Combined Cycle Unit into Empire's distribution/transmission system.
9. There are no operational limits on the Combined Cycle Unit imposed by other agencies and/or government entities, such as Missouri Department of natural resources.
10. All testing will be completed by midnight on July 31, 2001.

Staff's in-service criteria for a combustion turbine unit with a nameplate capacity of 90 MW or less, and which has been in operation for more than 6 months with at least 500 hours of operation. (07/04)

1. All major construction work is completed
2. All pre-operational tests have been successfully completed.
3. Unit will demonstrate the capability to operate as designed in regards to the start sequence.
4. Unit will demonstrate the capability to operate as designed in regards to the shutdown sequence.
5. Unit will demonstrate the capability to operate as designed at a minimum load.
6. Unit will demonstrate the capability to operate as designed at nominal load.
7. Unit will successfully meet all contract operational guarantees.
8. Transmission facilities will successfully demonstrate its capability to export the entire plant net capacity.
9. Unit will successfully demonstrate its ability to start on liquid fuel.
10. Units will successfully demonstrate its ability to transfer from natural gas fuel to liquid fuel.

NOTES:

1. The unit's ability to demonstrate its capability to meet a criterion will be accomplished either by a review of the unit operating documents and maintenance documents, or an actual operational demonstration. The review will determine if there are operational problems such as a range of unstable load points, which prevents the unit from operating as per design.
2. Operate as designed means the unit is operating without major operational or maintenance problems requiring the unit to operate differently than the original design or the original design revised based on manufacturer's recommendations.
3. If the unit cannot demonstrate its ability to meet any of the criteria for which failure to meet the proposed criteria is judged to be immaterial to the overall in-service status of the unit, the Staff for good cause may waive that particular criteria. In making a decision to wave any particular criteria, the Staff may review the completed testing documentation, and any additional unit operating data, to determine if the unit should be considered in-service, without further testing. Staff will provide it's rational in the event it decides to waive any particular criteria.