Exhibit No.:
Issues: In-Service Criteria; Construction Audit; Maintenance Contract
Witness: David Elliott
Sponsoring Party: MoPSC
Type of Exhibit: True-Up Direct Testimony
Case No.: ER-2001-299
Date Testimony Prepared: August 7, 2001

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

TRUE-UP DIRECT TESTIMONY

OF

DAVID ELLIOTT

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-2001-299

Jefferson City, Missouri
August, 2001

****Denotes Highly Confidential Information****

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DIRECT TRUE-UP TESTIMONY

OF

DAVID W. ELLIOTT

THE EMPIRE DISTRICT ELECTRIC COMPANY

CASE NO. ER-2001-299

DIRECT TRUE-UP TESTIMONY

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Q. Please state your name and business address.

A. David W. Elliott, P.O. Box 360, Jefferson City, Missouri 65102.

Q. By whom are you employed and in what capacity?

A. I am employed by the Missouri Public Service Commission (Commission) as a Utility Engineering Specialist III in the Energy Department of the Utility Operations Division.

Q. Are you the same David W. Elliott who has previously filed direct and rebuttal testimony in this case?

A. Yes, I am.

Q. What were your responsibilities in the true-up audit of The Empire District Electric Company (Empire) rate case, No. ER-2001-299?

A. I was responsible for the in-service testing of the new State Line Combined Cycle (SLCC) unit, the construction audit of the new SLCC unit, and the review of the maintenance contracts for the units at State Line and the Energy Center.

Q. What are the Staff's recommendation regarding these areas of the true-up?

A. The Staff recommends that the SLCC unit be considered fully operational and used for service, that the $19 million of SLCC of cost overruns be included in rate

base, and that the maintenance contract annual amount be included in Empire's revenue requirement.

In-Service Test Criteria

Q. What is your conclusion regarding in-service testing of the SLCC unit?

A. Based on my review and analysis of the test data, the SLCC unit has met all of the required in-service test criteria. Therefore, I recommend that the SLCC unit be considered fully operational and used for service.

Q. What in-service test criteria did you use to determine whether the SLCC unit is fully operational and used for service?

A. I used the in-service test criteria contained in the Stipulation and Agreement Regarding In-Service Criteria filed on May 14, 2001.

Q. What information did you review to determine if the SLCC unit met each of the required in-service criteria?

A. I reviewed generation logs, test reports, and test data. Schedule 1 contains the details of my review and my analysis of the results of the tests.

Q. Please summarize the results.

A. The following is a summary of each criterion identified by a bullet followed by the results of the testing regarding that criterion:

- Criterion: Major construction work completed. Results: I toured the site on July 11, and found all major construction work completed. This criterion has been met.

- Criterion: Contract performance thermal testing will be completed. Results: I reviewed the results of the performance tests. This criterion has been met.
- Criterion: Unit will demonstrate a startup from turning gear to nominal capacity. Results: I reviewed data from June 19, 2001 indicating the unit has met this criterion.
- Criterion: Unit will demonstrate a shutdown from minimum load to turning gear. Results: I reviewed data from June 29, 2001 indicating the unit has met this criterion.
- Criterion: Unit will demonstrate operation at minimum load for one hour. Results: I reviewed data from June 29, 2001 indicating that the unit has met this criterion.
- Criterion: Unit will demonstrate operation at 95 % of nominal load for fours hours and at 98% of nominal load for one hour. Results: I reviewed data from June 21, 2001 indicating that the unit has met this criterion.
- Criterion: Unit will demonstrate a 48.3% capacity factor over a period of 168 hours. Results: I reviewed watt-hour meter readings from midnight June 18, 2001 through midnight June 26, 2001 indicating total megawatts generated within the 168 hour period. I calculated a capacity factor of greater than 48.3%; therefore, the unit has met this criterion.

- Criterion: Sufficient transmission capacity is available. Results: I reviewed the distribution system logs for June 21 and June 22, 2001, and the design capacity ratings of the transmission lines from State Line Plant. My review of these documents indicates that there is sufficient transmission capacity. This criterion has been met.
- Criterion: There are no additional operational limits. Results: I received the required signed statement from Empire stating that there are no known additional operational limits. This criterion has been met.
- Criterion: All testing be completed by midnight July 31, 2001. Results: I reviewed test data and all testing was completed by June 30, 2001. This criterion has been met.

Construction Audit

Q. Has a construction audit of SLCC unit been completed?

A. Yes. Staff auditors and engineers have completed a review of the SLCC unit construction costs, and have performed an inspection of the SLCC unit while it was operating on July 11, 2001.

Q. Have you identified any additional concerns with the cost overruns associated with the project other than those already identified in the Unanimous Stipulation and Agreement As To State Line Combined Cycle Unit Capital Costs filed on May 25, 2001, as those of the HRSG construction contractor?

A. No. I reviewed the cost overruns incurred on the project, and as per the 1, Empire has provided information to the Staff to adequately explain the additional cost overruns incurred by the SLCC unit beyond the HRSG cost overruns addressed in the Stipulation and Agreement. Staff's proposed rate treatment of the SLCC unit cost overruns is discussed in the True-up Direct testimony of Staff Witnesses Cary G. Featherstone and mark L. Oligschlaeger of the Accounting Department.

Q. What information did Empire provide to the Staff to explain the cost overruns?

A. Empire provided a document assembled by Black & Veatch identifying all of the construction project changes orders written as of the end of April 2001.

Q. What amount of additional cost overruns did the Staff review for the SLCC unit?

A. The Staff reviewed a total amount of additional cost overruns beyond the HRSG overrun of approximately $19 million.

Q. Can you summarize the cost overruns?

A. Yes. Schedule 2 identifies the major change order cost overruns.

Q. Is it unusual to have cost overruns on a project of this size?

A. No. Most construction projects have cost overruns. The larger the project, the more complex the project is. The more complex a project is, the more likely it is that unforeseen events will occur as construction progresses.

Q. Does this explain all of the cost overruns on this project?

A. No. Some of the cost overruns are due to this project being a "fast-track" type of project. In order to reduce the amount of time for completion of this project,

contracts were issued prior to the completion of the final design. This allowed the issuing of contracts while the final engineering phase was going on.

Q. How can contracts be issued before the final design is completed?

A. This is possible if the design is complete enough to be able to identify most of the equipment and/or construction work needed for contractors to bid on, and a contract to be issued. These contracts are then subject to revisions via change orders after the final design has been completed. Some of Empire's contracts were written with specified unit prices for material but no fixed quantities, specifically to allow for change orders to be written for additional material at a known cost.

Q. What information did you review to identify the cost overruns?

A. I reviewed the major change orders written relating to increased project cost estimates, and discussed them with Empire.

Q. Did you group these change order costs into major categories?

A. Yes. I have identified six categories in which the major change orders can be grouped. These six categories are:

I. Change orders due to the final Black & Veatch design.

II. Change orders due to the craft incentive plan and pay increases.

III. Change orders due to the project design additions made by Empire.

IV. Change orders due to the changes made for unexpected conditions discovered during the construction.

V. Change orders due to moving work scope from time & material contracts to fixed price contracts.

VI. Change orders due to minor changes to work.

Q. Please explain category I.

A. These change orders were required because this project was a fast track project. At the time the contracts were written the final design was not complete, so some contracts were issued with the expectation that change orders would need to be written later for additional material and/or labor. An example would be the high-pressure pipe supply contract. The contract specified a fixed price for a known amount of high-pressure pipe and a price list for different types of high-pressure pipe, which would be used to order additional pipe covered in change orders. These change orders caused an increase in costs above the original contract awarded cost.

Q. Please explain category II.

A. These change orders were written for the additional costs associated with attracting and keeping qualified craft laborers on the job. Staff has reviewed documentation, including the monthly project reports, and interviewed Empire personnel and believes that these incentives were necessary to attract and keep an adequate work force of qualified craft laborers on the project.

Q. Please explain category III.

A. These change orders were written for the additional design changes made by Empire as the project progressed. An example of this would be the overhead crane for the combustion turbines. Empire made a decision to add an overhead crane to increase the productivity of the combustion turbine maintenance overhauls.

Q. Please explain category IV.

A. These change orders were written for the additional work and/or material needed to overcome unforeseen problems that occurred during the construction. An

example of this would be the additional water well and pumps needed to supply the proper water flow for the SLCC unit. The original design required a specific number of wells, but, after drilling that number of wells, it was determined that the water flow was not adequate for the SLCC unit. An additional well and pump were added to the contract of the well driller.

Q. Please explain category V.

A. These change orders were written in order to transfer certain work from a time-and-material contractor to a fixed-price contractor. An example of this was the work of painting the SLCC unit. The original plan was to have the painting done by the time-and-material contractor so there was no "awarded" contract cost for painting. As the project progressed it was decided to transfer this painting to a contractor with a fixed-price contract for other work. The cost of the painting is thus represented by a change order to a fixed price contract. Although the painting was always a part of the project, since it was added by change order to a fixed price contract, it shows up as a cost overrun.

Q. Please explain category VI.

A. On any project there is a possibility that some of the work will not follow the original design or the planned construction. On a project of this size, with many different pieces of equipment built by different suppliers, which are designed to be assembled into one operating unit, the number of possible construction problems increases. Other work such as plant road maintenance, plant site cleanup, lay down area preparation, temporary lighting set-up, fire safety equipment maintenance, equipment or material placement with small crane, and mechanical equipment final adjustments are all

part of the work in this category. Typically, the engineer on a project attempts to plan for this kind of work by including a contingency amount to cover the costs incurred for this unexpected or unforeseen work. Typically, this contingency amount could be five percent of the total project cost. However, there was no contingency amount included in the original estimate for the SLCC unit project.

Q. What is Staff's recommendation of the SLCC Unit project costs?

A. Staff recommends these costs be subject to rate base treatment, with the exception of the HRSG disallowance agreed to earlier among the parties to this proceeding.

Maintenance Contracts

Q. Has Empire entered into a contract for major maintenance on the SLCC unit, the State Line Unit #1 (SL1), the Energy Center Unit #1 (EC1), and the Energy Center Unit #2 (EC2)?

A. Yes. Empire has entered into two contracts: one for major combustion turbine maintenance on the SLCC unit, and one for major combustion turbine maintenance on the SL1, EC1, and EC2 units.

Q. Have you reviewed these contracts?

A. Yes. I have reviewed both contracts.

Q. What is your conclusion?

A. The annual contract costs associated with the major combustion turbine maintenance work should be included in Empire's true-up revenue requirement. These costs are reasonable as they will likely result in better equipment parts procurement, and

shorter maintenance outage schedules, which will result in better overhaul maintenance of the combustion turbines.

Q. Does this conclude your true-up direct testimony?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

IN THE MATTER OF THE APPLICATION OF THE EMPIRE DISTRICT ELECTRIC COMPANY FOR A GENERAL RATE INCREASE	))))	Case No. ER-2001-299

AFFIDAVIT OF DAVID ELLIOTT

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

David Elliott, of lawful age, on his oath states: that he has participated in the preparation of the foregoing written testimony in question and answer form, consisting of 10 pages of testimony to be presented in the above case, that the answers in the attached written testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

David Elliott

Subscribed and sworn to before me this 6th day of August, 2001.

DAWN L. HAKE
Notary Public – State of Missouri
County of Cole
My Commission Expires Jan 9, 2005

Notary Public

My commission expires

STATE LINE GENERATING STATION
COMBINED CYCLE UNIT

THE EMPIRE DISTRICT ELECTRIC COMPANY
Case No. ER-2001-299

STAFF RECOMMENDATIONS ON IN-SERVICE

JULY 2001

Schedule 1-1

IN-SERVICE CRITERIA FOR DETERMINING THE OPERATIONAL
STATUS OF THE NEW STATE LINE COMBINED CYCLE (SLCC) UNIT
As per Stipulation and Agreement Regarding In-Service Criteria filed on May 14, 2001

4a.[1] Major construction work, and pre-operational tests have been successfully completed such that the SLCC may be operated and successfully complete criteria items b) through g).

4b. Contract thermal performance guarantee tetsting 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/Erikson Heat Recovery Steam Generators.

4c. The SLCC will demonstrate its ability to startup from turning gear operation to nominal capacity on natural gas fuel when prompted by the operator.

4d. The SLCC will demonstrate its ability to shutdown from minimum load resulting in turning gear operation when prompted by the operator.

4e. The SLCC will demonstrate its ability to operate at minimum load for one hour on natural gas.

4f. The SLCC will demonstrate its ability to operate at or above 95% of nominal capacity for four continuous hours on natural gas fuel. During the test the unit will demonstrate its ability to operate at or above 98% of nominal capacity for one hour.

4g. The SLCC 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 when calculated by the formula shown in note 4.

4h. Sufficient transmission facilities shall exist to carry the total design net electrical capacity of the SLCC into Empire's distribution/transmission system.

4i. There are no operational limits on the SLCC imposed by other agencies and/or government entities, such as Missouri Department of Natural Resources, other than those provided by permit.

4j. All testing will be completed by midnight on July 31, 2001.

[1] This number references the section number of the Stipulation and Agreement Regarding In-Service Critera.

NOTES:

1) 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 criterion. In making a decision to waive 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 its rationale in the event it decides to waive any particular criterion.

2) It is the Staff's intention, when possible, to witness the unit's ability to meet the criteria items. Regardless, Empire will provide to Staff all necessary documentation, including operating data logs, clearly demonstrating the capability of the unit to meet each of the criteria items.

3) The "nominal capacity" of the SLCC shall be 500 megawatts, at ISO conditions (i.e. 59 degrees F and 60% relative humidity). The term "nominal heat rate" shall be defined as 7200 BTU/ kWh HHV when operating at nominal capacity. Manufacturer supplied ambient correction factors will be used when operation occurs at other than ISO conditions.

4) Capacity Factor of 48.3% = (Mwhrs generated in a 168 hour period) / ((nominal capacity) x (168 hours).

5) The contract performance guarantees referenced in criteria item 2 can be found in the Westinghouse Combustion Turbine contract section IVa, the Westinghouse Steam Turbine contract section IVb, and the Nooter/Erikson contract Table 2A-1 and Section GC-40.2. Manufacturer supplied ambient correction factors will be used when operation occurs at other than ISO conditions.

6) If any test is completed using only Empire's ownership portion of 300 MW, instead of the nominal capacity of 500 MW, Empire will provide written documentation stating the reasons why Empire was required to operate the unit at 300 MW. Included in this documentation will be a summary of all conversations held with Western Resources, the joint owner, regarding the operation of the unit at 500 MW.

CRITERION NO. 4a

Major construction work, and pre-operational tests have been successfully completed such that the SLCC may be operated and successfully complete criteria items 4b) through 4g).

On July 11, 2001 Staff visited State Line and toured the SLCC facility. At the time of the tour the unit was operating at approximately 300 MW. Staff observed that all of the major equipment was operating. Staff observed that only minor construction items were on-going. These items included outside lighting, and some road work.

Based on its observations and discussions with Empire, Staff concludes this criterion has been satisfied.

CRITERION NO. 4b

Contract thermal 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/Erikson Heat Recovery Steam Generators.

A summary of the preliminary results of the testing performed was provided by Empire See appendix A-1.

Based on a review of the information provided by Empire, Staff concludes this criterion has been satisfied.

CRITERION NO. 4c

The SLCC will demonstrate its ability to startup from turning gear operation to nominal capacity on natural gas fuel when prompted by the operator.

Empire provided a copy of the historical trend for the period of **_____ _____** on June 21, 2001 indicating that the unit went from turning gear to nominal load. See appendix A-2.

Based on a review of the information provided by Empire, Staff concludes this criterion has been satisfied.

CRITERION NO. 4d

The SLCC will demonstrate its ability to shutdown from minimum load resulting in turning gear operation when prompted by the operator.

Empire provided a copy of the historical trend for the period of **_____ _____** on June 29, 2001 indicating that the unit went from **_____ _____** to turning gear. See appendix A-3.

Based on a review of the information provided by Empire, Staff concludes this criterion has been satisfied.

CRITERION NO. 4e

The SLCC will demonstrate its ability to operate at minimum load for one hour on natural gas.

Empire provided a copy of the historical trend for the period of **_____ _____** on June 29, 2001 indicating that the unit operated at approximately **___ _____** for one hour. See appendix A-4.

Based on a review of the information provided by Empire, Staff concludes this criterion has been satisfied.

CRITERION NO. 4f

The SLCC will demonstrate its ability to operate at or above 95% of nominal capacity for four continuous hours on natural gas fuel. During the test the unit will demonstrate its ability to operate at or above 98% of nominal capacity for one hour.

Empire provided copies of the historical trend for the period of **_____ _____** on June 21, 2001 indicating that the unit operated at or above 95 % of nominal capacity for four hours, and 98% of nominal capacity for one hour. See appendix A-5.

Load for four hours = **___** MW
Load for one hour = **___** MW.

Requirement for four hours: (500 MW) x (0.95) = 475 MW
Requirement for one hour: (500 MW) x (0.98) = 490 MW

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Based on a review of the information provided by Empire, Staff concludes this criterion has been satisfied.

CRITERION NO. 4g

The SLCC 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 when calculated by the formula shown in note 4.

Empire provided copies of the historical trend for the period of **_____** on June 19, 2001 through **_____** on June 26, 2001 indicating that the unit operated for a period of 168 hours. See appendix A-6.

Empire provided the midnight readings from the SLCC unit watthour meter for June 19, 2001 through June 26, 2001 indicating the unit generated **____** MWhrs. See appendix A-6.

The calculated capacity factor is **___**%, which is greater than 48.3%.

Capacity factor = **_____** / (500 x 168) x 100 = **_____**

Based on a review of the information provided by Empire, Staff concludes this criterion has been satisfied.

CRITERION NO. 4h

Sufficient transmission facilities shall exist to carry the total design net electrical capacity of the SLCC into Empire's distribution/transmission system.

Empire provided the distribution system logs for June 21 and June 22, 2001, and a summary of the original design of the transmission lines from State Line indicating the total design load. See appendix A-7.

Based on a review of the information provided by Empire, Staff concludes this criterion has been satisfied.

CRITERION NO. 4i

There are no operational limits on the SLCC imposed by other agencies and/or government entities, such as Missouri Department of Natural Resources, other than those provided by permit.

Empire provided a signed statement dated July 31, 2001 signed by Brad Beecher, Vice-President of Operations of The Empire District Electric Company, indicating that as of

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July 31, 2001 Empire has not been notified of any additional limitations on the unit beyond those of the existing permits. See appendix A-8.

Based on a review of this information and discussions with Empire, Staff concludes this criterion has been satisfied.

CRITERION NO. 4j

All testing will be completed by midnight on July 31, 2001.

Empire provided historical trends indicating testing was completed by June 30, 2001. Staff concludes this criterion has been satisfied.

APPENDIX A-1

SCHEDULES 1-9 THROUGH 1-41

ARE DEEMED HIGHLY CONFIDENTIAL

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APPENDIX A-8

CASE NO. ER-2001-299
STATE LINE COMBINED CYCLE
IN-SERVICE TEST CRITERIA

4i) There are no operational limits on the SLCC imposed by other agencies and/or government entities, such as Missouri Department of Natural Resources, other than those provided by permit.

EDE RESPONSE: SLCC has no operational limits imposed by the Missouri Department of Natural Resources or other agencies and/or government entities, other than those provided by permit.

Bradley P. Beecher

Mr. Bradley P. Beecher,

Vice President of Energy Supply,

The Empire District Electric Company

SCHEDULE 2 IS DEEMED

HIGHLY CONFIDENTIAL

IN ITS ENTIRETY

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