

TRI-COUNTY ELECTRIC
COOPERATIVE, INC.
EXHIBIT D

STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

ILLINOIS
COMMERCE COMMISSION
2009 SEP 29 1 P 4: 57
CHIEF CLERK'S OFFICE

TRI-COUNTY ELECTRIC)
COOPERATIVE, INC.,)
)
Complainant,)
)
vs.)
)
ILLINOIS POWER COMPANY, d/b/a)
AMEREN IP,)
)
Respondent.)

Case No. 05-0767

PREPARED DIRECT TESTIMONY OF ROBERT C. DEW, JR. P.E.
IN SUPPORT OF TRI-COUNTY ELECTRIC COOPERATIVE, INC.

- 1 Q: Please state your name.
- 2 A: Robert C. Dew, Jr. P.E.
- 3 Q: What is your occupation?
- 4 A: I am a professional engineer registered in the state of Illinois as well as other states of the
- 5 United States.
- 6 Q: Who are you employed by?
- 7 A: I am employed by Hi-Line Engineering, LLC, 1850 Parkway Place, Suite 800, Marietta,
- 8 Georgia 30067.
- 9 Q: What is your education and training?
- 10 A: I hold a high school diploma and a bachelor of science degree in electrical engineering
- 11 received from Purdue University at West Lafayette, Indiana in 1971. I did post graduate
- 12 work in Electrical Engineering at Georgia Institute of Technology, Atlanta, Georgia, from

1 1976 to 1977 and received an MBA from Butler University, Indianapolis, Indiana in
2 1981.

3 Q: What is your professional work experience, memberships, professional registrations and
4 publications?

5 A. My professional work experience, memberships, professional registrations and
6 publications are listed on the Exhibit D-1 attached to my direct testimony.

7 Q: Were you requested by Tri-County Electric Cooperative, Inc. to examine the installation
8 of electric service by citation Oil & Gas Corporation to a gas plant and eight gas
9 compressor sites in Salem Unit Oil Field in Salem County, Illinois?

10 A: Yes. I was requested by Tri-County Electric Cooperative, Inc. (Tri-County) to examine
11 the installation of electric service by Citation Oil & Gas Corporation (Citation) to a gas
12 plant and eight compressor sites used to feed the gas plant located on property in Marion
13 County, Illinois, and depicted on the maps marked Exhibit A-2 and Exhibit A-3 attached
14 to the direct testimony of Marcia K. Scott filed in this matter. I was further requested to
15 inspect an electrical substation owned by Illinois Power Company dba AmerenIP known
16 as the Texas substation which is used to provide electric service to Citation for use in its
17 Salem Unit Oil Field.

18 Q: What did you find as a result of your investigation?

19 A: Upon investigation, I determined that Tri-County has provided electric service in Marion
20 County, Illinois since 1939 in the vicinity of what is now known as the Salem Unit Oil
21 Fields, currently owned by Citation. Tri-County currently provides electric service to the
22 Citation office complex for the Salem Unit Oil Field. In addition, Citation receives
23 electric service from the Texas substation which Citation then distributes by means of the

1 Citation owned electrical distribution system operating at a distribution voltage of 12,470
2 volts to the electrical service connection located at the gas plant and each of the eight
3 compressor sites in question in this case.

4 Q: Did you make an investigation of the gas plant location and the eight gas compressor site
5 locations?

6 A: Yes. I made inspections of the gas plant location, the eight compressor site locations and
7 the Texas substation to which the Citation distribution system is connected on Monday,
8 October 16, 2006 and Tuesday, December 19, 2006.

9 Q: What did your investigations reveal?

10 A: I determined the gas plant is located 200 to 250 feet north of Tri-County' three phase line
11 along Green Street Rd. and in Tri-County's service territory. I further reviewed
12 numerous documents, drawings, work orders, and diagrams of the IP Texas substation
13 provided by IP during discovery in this case which together with my personal inspections
14 has enabled me to develop a chronology of the modifications, additions and/or changes to
15 the Texas substation from the date of the earliest documents Tri-County received in
16 discovery in this case dating from 1952 to the current time.

17 Q: Did you prepare an engineering report as a result of your investigations of the site and
18 your review of documents furnished by IP in discovery?

19 A: Yes. I have prepared an engineering report dated October 2007 based upon my personal
20 inspections and review of documents concerning the electrical service connections by
21 Citation to the gas plant and the eight compressor sites and with respect to the IP Texas
22 substation. The engineering report is attached to my direct testimony as Exhibit D-2.

23 Q: Based upon your experience in the electric utility industry, do you have knowledge as to

1 what the electric utility industry considers a "point of delivery" when an electric supplier
2 provides electric service to a customer?

3 A: Yes. Generally, the electric utility industry considers a "point of delivery" as the
4 connection between a distribution line and a transformer or series of step down
5 transformers used to reduce the distribution line voltage to a level that can be used by
6 motors and equipment of a customer at the customer's premises. In the instant case, step
7 down transformers with cutouts, fuse protection, mounting brackets on utility poles as
8 well as appropriate service conductors have been installed at the Citation gas plant and at
9 each of the Citation compressor sites. The purpose of the transformers in each instance
10 in this case is to reduce the distribution line voltage of 12,470 volts to 277/480 volts at
11 each of the compressor sites and to 277/480 volts at the gas plant which is the voltage
12 level required for operation of the motors and equipment at each of the compressor sites
13 and gas plant respectively.

14 Q: For what period of time has the meaning of "point of delivery" of electric service as you
15 have explained it been recognized by electric utility engineers who work in the electric
16 utility industry?

17 A: It is my opinion based upon my engineering experience in the electric utility industry
18 since 1972 which includes working with other electric utility engineers who have worked
19 in the electric utility industry for 30 years prior to 1972, that "point of delivery" as
20 understood and utilized in the electric utility industry includes all service connection
21 points at which distribution line or transmission line voltage is reduced to a level that can
22 be utilized by the customer to operate the customer's equipment, machinery and motors.
23 Thus, it is my opinion that this has been the understood meaning of "point of delivery"

1 since prior to the date of the Service Area Agreement between Tri-County Electric
2 Cooperative, Inc. and Illinois Power Company d/b/a AmerenIP.

3 Q: Do you have an opinion based upon your engineering experience and training whether
4 the electric service connections you just described for the electrical connections to the
5 Citation gas plant and the eight gas compressor sites are generally recognized for
6 engineering purposes in the electric utility industry as "points of delivery" of electric
7 service?

8 A: Yes. I have an opinion.

9 Q: What is your opinion?

10 A: It is my opinion based upon my engineering training and experience in the electric utility
11 industry that such service connection points are generally recognized for engineering
12 purposes in the electric utility industry as a "points of delivery" of electric service. It is
13 also my opinion that the service connection points between the Citation distribution line
14 at which are located a bank of three step down transformers with cutouts, fuse protection,
15 mounting brackets on a wooden utility poles as well as appropriate service conductors for
16 the purpose of reducing the distribution line voltage of 12,470 volts to 277/480 volts
17 constitute "points of delivery" at each of the eight Citation compressor sites. It is further
18 my opinion that the service connection point consisting of a pad mounted three phase
19 transformer along with cutouts, fuse protection and associated electrical apparatus
20 installed for the purpose of reducing the Citation distribution line voltage from 12,470
21 volts to 277/480 volts for use in operating the electric motors and equipment located at
22 the gas plant constitutes a "point of delivery" within the electrical utility industry.

23 Q: Are you aware that IP, through its engineer Michael Tatlock, presented an affidavit in

1 support of IP's request for a Summary Judgment in this docket, in which affidavit
2 Michael Tatlock stated that the customer's "point of delivery" for electric service as
3 recognized in the utility industry is the place where electricity is "handed off" to the
4 customer?

5 A: Yes. I have read Michael Tatlock's statement on that matter.

6 Q: Do you have an opinion, based on your experience working in the electric utility industry,
7 whether that statement by Michael Tatlock is accurate?

8 A: Yes. I have an opinion.

9 Q: What is your opinion?

10 A: The "point of delivery" as referred to by Michael Tatlock relates to the point at which
11 assignment for liability resulting from the electric energy is transferred from the electric
12 supplier to the customer. Generally, "point of delivery" for purposes of assigning
13 liability is the same location where the distribution line voltage is reduced to a voltage
14 level that can be used by the customer to operate equipment which is generally located
15 within a very close distance to the "point of delivery". The meaning attributed to "point
16 of delivery" by Michael Tatlock takes into account only one purpose of "point of
17 delivery" and fails to include the complete meaning of "point of delivery" as used in the
18 electric utility industry.

19 Q: Do you have an opinion whether it would be in accord with accepted engineering practice
20 in the electric utility industry to reduce the voltage down to 277/480 volts at the point
21 where the Citation 12,470 volt three phase line connects to IP's Texas substation before
22 transmitting the electric current from the Texas substation to the location of the gas plant
23 and the location of each of the gas compressor sites?

1 A: Yes, I have an opinion.

2 Q: What is your opinion?

3 A: You could not reduce the voltage to 277/480 volts at the point where the Citation three
4 phase line connects to the IP Texas substation and expect to have adequate voltage
5 delivered to the location of the gas plant almost one mile from the Texas substation and
6 compressor sites sufficient to operate the equipment at those locations because of the
7 electric principal of excessive voltage drop created by the distance and the higher current
8 at 480 volts. Such an arrangement simply would not provide sufficient voltage to
9 operate the electric motors at each of the Citation sites at issue in this case. That is why
10 the electric utility industry follows the engineering practice of distributing electricity over
11 distribution lines at a much higher voltage than can be utilized by a customer's equipment
12 at the place where the customer's equipment is located. Further, that is why transformers
13 are required at the location of the customer's equipment to reduce the voltage of the
14 electricity delivered at that point to a voltage the customer's equipment can utilize. It is
15 this point the electric utility industry has consistently defined as the "point of delivery" of
16 electricity to the customer.

17 Q: Based upon your inspections of the IP Texas substation and the review of documents
18 furnished by IP in discovery regarding the Texas substation, do you have an opinion
19 whether there have been modifications by IP to the Texas substation?

20 A: Yes. I have an opinion.

21 Q: What is that opinion?

22 A: It is my opinion that there have been numerous modifications and additions to the IP
23 Texas substation since 1968.

1 Q: What has been the effect of the IP modifications to the Texas substation?

2 A: The modifications have allowed IP to increase the capacity of the substation to serve
3 additional customer electric load from that substation including the electric load to
4 Citation.

5 Q: Can you summarize these modifications to the Texas substation which have enabled IP to
6 serve additional customer electric load?

7 A: In the substation currently are three single phase transformers, Wagner brand
8 3333KVA each with serial numbers C9C1030, C9C1031, and C9C1029. The IP
9 representative informed us they were of 1948 vintage, but it was unknown when these
10 transformers were first installed in the Texas Substation. These transformers were tested
11 in July 22, 1965 at the Texas substation according to the Doble reports I received. The
12 installation in October 3, 1978 of the new three phase transformer with a Westinghouse
13 brand serial #PGR-51281 (10/12/14 MVA) and a date of manufacture stamped into the
14 name plate of 1969 caused extensive modification to the substation. This transformer
15 was installed in October 3, 1978. Additionally, the following modifications were
16 documented to have been completed:

17	Date	Modification
18	8/1957	1. Illinois Power Company installed a 69kV line bay addition per
19		Work Order 25734 in August 1957. This addition references drawing
20		AE-MAG1-91.3.
21	1964	2. Illinois Power Company added cooling fans to the three-3333kVA
22		transformer bank in 1964 per Work Order 26705.
23	5/1965	3. Illinois Power Company added a 3 phase 5000 kVA transformer to

- 1 the Texas Substation in May 1965 per Work Order 26936. Also added
2 were power fuses, metering, 69 kV airbreak switch, buss work, etc.
- 3 1967 4. Illinois Power Company changed the tap on the transformer from
4 Position A (69300/7200 V.) to Position B (67650/7200 V.) in 1967. This
5 is usually done to offset voltage drop in the existing transmission line due
6 to increased loading. This is indicative of additional load being added to
7 the transmission line at the Texas Substation and possibly other locations.
- 8 2/1968 5. Illinois Power Company installed a switch tower (69 kV type PF-2)
9 disconnect switch per Joslyn Co. – Hi-Voltage Equipment Division
10 drawing 3085C0233 dated February 1, 1968. This was probably done in
11 conjunction with doubling the size of the substation. A copy of drawing
12 3085C0233 is attached as Exhibit D-3.
- 13 10/1961 6. Illinois Power Company installed a 12 kV 3000 KVAR capacitor bank
14 in the Texas Substation per Work Order 26374 in October 26, 1961 and
15 referenced drawing #AE-MAG1-91.4.
- 16 1969/1976/1991 7. In 1969 through 1971, Illinois Power Company added a 3000
17 KVAR capacitor bank in 1969; replaced transformer No. 2 in 1976
18 (transformer No. 2 had been added to the Texas substation in 1965);
19 and added a GE type vacuum circuit breaker in 1991, reference drawing
20 CE-MAG1-51.2. All of these additions and modifications increased
21 significantly the capacity of the Texas substation to handle additional
22 electric load.
- 23 1970 & 4/1971 8. Illinois Power Company purchased a 6000 KVAR capacitor bank on

1 the 69 KV high side in December 1970 per Work Order #25860 and
2 installed this 69 kV-10,800/6000 T-KVAR capacitor bank per Work Order
3 #25860 for the Texas Substation in April 1971. Also installed at
4 this time were automatic controls and motor operated switches. High
5 voltage switched capacitors are typically added to correct the excessive
6 voltage drop on transmission circuits. Voltage drop in general is the
7 result of adding load to a transmission supplied substation. When the
8 added load becomes significant enough, then excessive voltage drop
9 occurs and corrective action, like adding a switched capacitor bank,
10 becomes necessary to fix the problem. A copy of Work Order #25860 is
11 attached as Exhibit D-4.

12 1973 9. Illinois Power Company added a 15 kV oil circuit breaker to protect
13 Transformer #2 in 1973 per Work Order 26727. This work order
14 references drawing AE-MAG1-91.8. The buss work had to be changed to
15 accommodate this OCB.

16 10/1974 10. In October 1974, Illinois Power Company installed a number of high
17 side lightning arrestors as well as a number of low side lightning arrestors
18 along with a GE Oil Blast Circuit breaker type FKD. With associated
19 relays, amp meters, and disconnect switch per the starting notice dated
20 above but containing no work order number.

21 1974 11. In 1974, Illinois Power Company added a 1200 Amp 14.4 kV oil
22 circuit breaker.

23 10/1974 12. Illinois Power Company installed a 15 KV oil blast circuit breaker

- 1 rated at 1200 Amps along with associated relays, meters, lightning
2 arrestors, cabinets, etc. in October 1974. A copy of work description is
3 attached as Exhibit D-5.
- 4 6/1976 13. In June 1976, Illinois Power Company installed 48-100 KVAR
5 capacitors and an associated time switch on the low side of the Texas
6 Substation per work Orders #851-25334 and #851-65334 and referenced
7 drawing AE-MAG1-91.9.
- 8 11/1976 14. On November 18, 1976, Illinois power Company installed two sets of
9 current transformer per Work Order #25334-65334 in the Texas
10 Substation.
- 11 10/1978 15. Illinois Power Company, per Work Order #851-25401 and Work
12 Order #851-65401 dated October 3, 1978, installed a 3 phase – 10/11.2/14
13 MVA Westinghouse transformer, associated current transformers,
14 lightning arrestors and fuses after removing a Wagner 3 phase – 6250
15 KVA transformer, current transformers and power fuses. These Work
16 Orders were dated October 3, 1978 and referenced drawing
17 AE-MAG1-91.10. This addition added kVA capacity to the substation.
18 A copy of Work Order #851-25401 is attached as Exhibit D-6.
- 19 1988 16. In 1988, Illinois Power Company added three-600 Amp hook stock
20 disconnect switches per Work Order # (851)27317.
- 21 5/1991 17. Illinois Power installed a remote load control device for interruptible
22 customer load power per their Work Order #25328 in May 1991.
- 23 1991 18. Illinois Power Company added a 15 kV breaker and metering to the

1 Texas Substation per Work Order 25676 in 1991.

2 6/1991 19. Illinois Power Company modified the foundation for the Texas
3 substation per Work Order #25626-F.

4 1992 20. Illinois Power Company added a SCADA system and associated
5 communication additions which allow IP to maximize the existing
6 capacity carried by the substation thereby allowing IP to serve
7 additional load from the substation.

8 5/2003 21. Illinois Power Company replaced the 3 phase, voltage regulator at
9 the Texas Substation with 6 single phase, 167 kVA voltage regulators per
10 Work Order 26299 in May 2003.

11 In addition, I have attached miscellaneous IP Texas substation drawings as Group Exhibit
12 D-7. All other IP work orders and drawings for the Texas substation that I examined and
13 refer to in my engineering report are in the possession of IP and identified on Exhibit
14 D-8 attached to my direct testimony.

15 Q: Have you detailed in your engineering report the basis for your determination that the
16 foregoing described work to the Texas substation constitutes changes or modifications
17 increasing the Texas substation capacity?

18 A. Yes. I have detailed in my engineering report attached to my direct testimony as Exhibit
19 D-2 each of the foregoing changes and modifications to the IP Texas substation along
20 with other modifications and/or changes and the basis for my determination that these
21 changes and/or modifications increased the capacity of the IP Texas substation to serve
22 additional electric load.

23 Q: Based upon your inspections of the Texas substation and your review of the documents

1 produced by IP in discovery regarding the Texas substation, were you able to arrive at a
2 cost to IP for the various modifications or changes?

3 A: Yes. Based upon my personal examination of the Texas Substation and my analysis of
4 the documents that I have received concerning the Texas Substation, it is easy to see that
5 this substation has been extensively modified over the years that it has been in existence.
6 Since AmerenIP did not supply any costs to me concerning these upgrades, it is difficult
7 to estimate these costs after the fact. However, due to the extensive upgrade and
8 modifications that I have observed, and based upon my experience as an electrical
9 engineer engaged in the design and construction of electrical facilities including
10 substations, it would be my opinion based upon a reasonable degree of engineering
11 certainty that AmerenIP has spent from \$500,000.00 to \$1,000,000.00 or more on the
12 modifications to this substation over its life to serve existing and new load out of this
13 substation.

14 Q: Did you inspect the Citation 12,470 volt distribution line from its point of connection at
15 the Texas substation to the new service connection point at the Citation gas plant?

16 A: Yes.

17 Q: Will you explain what your inspection of the Citation distribution line and review of the
18 Citation map revealed?

19 A: I visually inspected the 12,470 volt Citation distribution line from the point where it
20 connects with the IP Texas substation to the new service connection point at the Citation
21 gas plant. Based upon my inspection and my review of the "Citation" map attached to
22 the direct testimony of Marcia K. Scott as Exhibit 6 and a copy of which is attached to my
23 direct testimony, Citation rebuilt 1161 feet of No. 4 CU three phase line to 2/O ACSR

1 three phase line and constructed 4119 feet of 2/O ACSR three phase line together with
2 approximately 210 feet of underground three phase facilities and provided a three phase
3 pad mounted transformer and associated accessories at the gas plant in order to provide
4 adequate service to the Citation gas plant.

5 Q: Based upon your engineering training and experience in the electric utility industry, have
6 you formulated an opinion of the cost to Citation for such work:

7 A: Yes. Based upon my inspection of the aforesaid line and my engineering experience and
8 training and further based upon current costs of electric line construction, the total cost of
9 such construction is estimated to be \$76,335.00. The actual route of the aforesaid line
10 construction is shown on the map marked Exhibit A-3 attached to the direct testimony of
11 Marcia K. Scott and is also shown on the "Citation" map as a dotted line marked "Option
12 2", attached to the direct testimony of Marcia K. Scott as Exhibit A-6 and a copy of
13 which is attached to my direct testimony.

14 Respectfully submitted,

15 Robert E. Dew, Jr. P.E.

Tricountydewtestimony/jtelec

PROOF OF SERVICE

I, JERRY TICE, hereby certify that on the 28th day of September, 2009, I deposited in the United States mail at the post office at Petersburg, Illinois, postage fully paid, a copy of the Prepared Direct Testimony of Robert C. Dew, Jr. P.E. in Support of Tri-County Electric Cooperative, Inc. and attached hereto, addressed to the following persons at the addresses set opposite their names:

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