ORIGINAL

0000148335

BEFORE THE ARIZONA CORPORATION COMMISSION

RECEIVED

2013 OCT 15 P 3:40

AZ CORP COMMISSION
DOCKET CONTROL

COMMISSIONERS
BOB STUMP- CHAIRMAN
GARY PIERCE
BRENDA BURNS
BOB BURNS
SUSAN BITTER SMITH

DANIEL SINGER, Complainant, vs. TUCSON ELECTRIC POWER COMPANY, Respondent	DOCKET NO. E-01933A-12-0400 **NOTICE OF FILING DIRECT TESTIMONY**

Tucson Electric Power Company ("TEP") files the Direct Testimony of Edward Mansfield.

RESPECTFULLY SUBMITTED this 15th day of October 2013.

By _____
Kimberly A. Ruht
Tucson Electric Power Company
88 East Broadway, MS HQE910
P.O. Box 711
Tucson, Arizona 85702

and

Jason D. Gellman
Roshka, DeWulf & Patten, PLC
400 East Van Buren Street, Suite 800
Phoenix, Arizona 85004

Attorneys for Tucson Electric Power Company

Arizona Corporation Commission
DOCKETED
OCT 15 2013
DOCKETED BY

Original and 13 copies of the foregoing filed this 15th day of October 2013 to:

Docket Control
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Copy of the foregoing hand-delivered/mailed this 15th day of October 2013 to:

Belinda A. Martin
Administrative Law Judge
Hearing Division
Arizona Corporation Commission
400 West Congress Suite # 221
Tucson, AZ 85701-1347

Steven M. Olea, Director
Utilities Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Janice Alward, Chief Counsel
Legal Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Scott Hesla
Legal Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Keith A. Singer, P.L.L.C.
1325 North Wilmot, Suite 200
Tucson, Arizona 85712

By Debbie Amaral

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
BOB STUMP- CHAIRMAN
GARY PIERCE
BRENDA BURNS
BOB BURNS
SUSAN BITTER SMITH

DANIEL SINGER, Complainant, vs. TUCSON ELECTRIC POWER COMPANY, Respondent	DOCKET NO. E-01933A-12-0400

Direct Testimony of

Edward Mansfield

on Behalf of

Tucson Electric Power Company

October 15, 2013

TABLE OF CONTENTS

I. INTRODUCTION.

Q. Please state your name and business address?

A. Edward Mansfield. My business address is 4350 E. Irvington Road, Tucson, Arizona 85714.

Q. By whom are you employed and what are your duties and responsibilities?

A. I am employed by Tucson Electric Power Company ("TEP" or "Company") as a Transmission & Distribution Supervisor. I am responsible for the operations of the electric metering services group, which handles the installation, maintenance, and testing of all electric meters installed on all TEP generation, interconnection, wholesale, and retail accounts.

Q. Please describe your background and work experience

A. I have a Bachelor's Degree in Electrical Technology, and have been employed in the electric metering area of the electric utility industry for 27 years. I have worked at TEP in my current position for the last 5 years. Previously, I was employed in the same position at Ohio Edison for 12 years.

Q. Approximately how many meters has your department tested during your tenure at TEP?

A. In my time here at TEP, my department has tested more than 115,000 meters.

Q. What is the process that TEP uses to test meters and how can you tell if a meter is malfunctioning?

A. TEP meter tests are performed in compliance with ANSI C12.1-2008[1]. This consists of

[1] ANSI C12.1-2008 Section 5.1.2 et al. (American National Standard for Electric Metering: Code for Electric Metering, published by the National Electrical Manufacturers Association. Please see http://seari-nc.cn/iec/2012828155355.pdf)

applying a known test load (controlled by a computer) simultaneously to the meter being tested and also to a calibrated watt-hour standard (a precise meter). At the end of the test period, the reading from the meter being tested is compared to the reading from the standard meter and expressed as a percentage. Tests are performed at several different load values to ensure the meter is performing accurately across a range of loading. A reading of 100% means that the meter under test matches exactly to the standard meter.

Q. Was a meter test performed on the meter removed from 1325 N. Wilmot Road, Tucson Arizona 85712 ("Wilmot Central")?

A. Yes.

Q. Did the test indicate the meter removed from Wilmot Central was malfunctioning?

A. No. According to the tests performed on the meter, the meter was functioning within the tolerances of +-3% (which correspond to test results between 97% and 103%) as set by the Arizona Corporation Commission.[2] The Wilmot Central meter tested at 99.89% on full load and light load[3]. This means that the meter was 0.11% slow. This correlates to every 1,000 kilowatt-hours ("kWh") of true energy consumed by the customer's load, the meter would register 998.9 kWh. So this result is to the benefit of the customer. See Exhibit A.

Q. Mr. Mansfield, in light of the results of the meter test, would you have any reservations in re-installing this meter for any other account?

A. No, I would not have any reservations.

[2] Arizona Administrative Code R14-2-209(E).
[3] See ANSI C12.1-2008 section 5.1.2.1

Q. Interval load data was also extracted from the meter, would you please summarize your findings?

A. The meter retains the most recent three months of interval load data. By extracting the interval load data, I was able to create a Load Profile Demand Graph (See Exhibit B). The graph shows that on March 26, 2012 at approximately 4:00pm, the demand of the building increased four-to-five times what it had been running previously. It also shows that the demand fluctuated daily, as would be expected with equipment turning on and off, but generally remains at that increased level until May 12, 2012. After May 12, 2012, the interval load data reveals that the demand starts to reduce, and continues to decline to its pre-increase level, until May 17, 2012 when the meter was removed and replaced at the customer's request.

Q. In your experience, have you ever seen a meter malfunction such that it over registers (reads high), and then returns to normal operation over time?

A. No. Generally, when an electronic meter fails such that it over registers, it is due to a component failure internal in the meter; and it does not "fix" itself, such that it would begin registering correctly again. Therefore, if the meter is removed and tested at TEP's meter testing facility, the over registration would be replicated and the percent error is precisely determined.

Q. Can you please describe the general characteristics of Wilmot Central as you understand them?

A. It is my understanding as described to me by a TEP customer service representative, that it is a three-story, 12,000 square-foot commercial building with approximately 16 air-conditioning units and a water tower. The different office spaces are not separately metered; there is one master meter on the property.

Q. Is there more than one way a building can increase its energy demand?

A. Yes. Demand comes from the entire electrical load. Generally, it comes from the HVAC equipment, lighting load, and any device plugged into the outlets, both permanent and portable. In addition to above-mentioned connected load, the diversity of the equipment operation (the on versus off time for cycled loads like HVAC, lighting etc.) can impact demand.

Q. Have you read Mr. Singer's Pre-hearing Statement, where it states that "Mr. Johns will further testify that the building's fault protection system would have engaged if the load reached the levels alleged by TEP and will testify to his observation that no such fault occurred. . ."?

A. Yes.

Q. What is a "fault protection system"?

A. A fault protection system typically refers to the circuit breakers on the main feed or supply of electric to the building. While the actual service entrance equipment (including the circuit breakers on the main feed) is owned by the customer, the metering equipment is owned by the utility. The service entrance is sized based on the projected load, both hard wired and potential load from outlets, during the initial construction of the building. The projected load includes things like HVAC equipment, lighting, outlets, and other known connections. The service entrance is designed to meet the National Electrical Code ("NEC") and any municipal ordinances and is sized to handle safely the projected load.

Q. Do you know what load level is necessary to engage Wilmot Central's fault protection system, and was the load recorded between March 26, 2012 and May 17, 2012 enough to cause that system to operate?

A. I do not know the breaker rating of the main or mains in the customer switchgear at

Wilmot Central. However, the transformer serving the building at Wilmot Central is 150 kVA. The service conductors (wires) connected to the transformer (which supply the customer's switchgear and are installed by the customer) are typically sized to match up closely with the main breaker ratings of the customer's switchgear. The service wires connected to the transformer here are capable of at least 960 amps, which correlates to 345 kVA. The peak load measured by the Wilmot Central meter was 89 kW; if a typical power factor is used for a building of this type, then that would be the equivalent of 105 kVA. 105 kVA is on only 59% of the transformer capacity, and 25% of the service conductor capacity.

Further, the replacement meter that was installed and has been in place since the meter in question was removed, measured a peak demand on December 12, 2012 of 87 kW, or within 2% of the peak demand registered by the meter in question. I believe this demonstrates that the building service can in fact support this type of demand.

II. CONCLUSION.

Q. Mr. Mansfield, in your opinion, was the increase in electric demand at Wilmot Central between March 26, 2012 and May 12, 2012 due to a malfunctioning meter?

A. In my opinion, no, I don't think the increase in electric demand was caused by a malfunctioning meter, and I reached that conclusion based on my 27 years of experience with electric meters, the fact that the meter indicated a reduced loading (demand) prior to its removal, and the meter test showed the meter to be operating within specification.

Q. Does this conclude your direct testimony?

A. Yes.

Exhibit

"A"

Tucson Electric Power Company

SINGLE AND THREE PHASE TRANSFORMER RATED

ATTN: BILLING

ISSUED BY: MS
DATE: 5/18/ 2011

[redacted]
NAME: WILMOT CENTRAL
ADDRESS: 1325 N MILMOT RD.

REASON FOR TEST: " PER CUSTOMER -PULL AND TEST "

METER CO. NO. TR9R-425 MAKE ITRON
TYPE CP1SR3 VOLTS 120 AMPS 2.5

SERIAL NO. 63989553 WIRE 4 PHASE 3 REG. RATIO ELEC. DISC.K 1.8
P.T. RATIO C.T. RATIO 3 400/5 DIAL K 80 SEAL
READING BEFORE 04802 DATE SET DATE REM 5/17/12
CREEP NO WATTS PER HR GROUND WATTS PER HOUR
CONDITION OF SEAL NOT REPORTED AS BROKEN STANDARD NO 10100
REMARK " SEE RESULTS "

AS FOUND

P.F. %		Amps.	Std. Coil	Std. Rev	Cor.	Kh.	Met. Rev.	Kh.	Element	% Error
100	F.L.	2.5								99.89
100	L.L.	25								99.89
50	F.L.	2.5								99.92
	L.L.									
	F.L.									

2046 REV 2/23/04

ADDITIONAL FACTORS

.25	99.90
0.5	99.88
1.0	99.92
1.5	99.96
2.5	99.94
3.0	99.95

METER/EQUIPMENT RELEASE

Meter/Equipment may be repaired or salvaged

Customer has been:

☐ Backbilled ☐ Notified of test results above

☐ Other

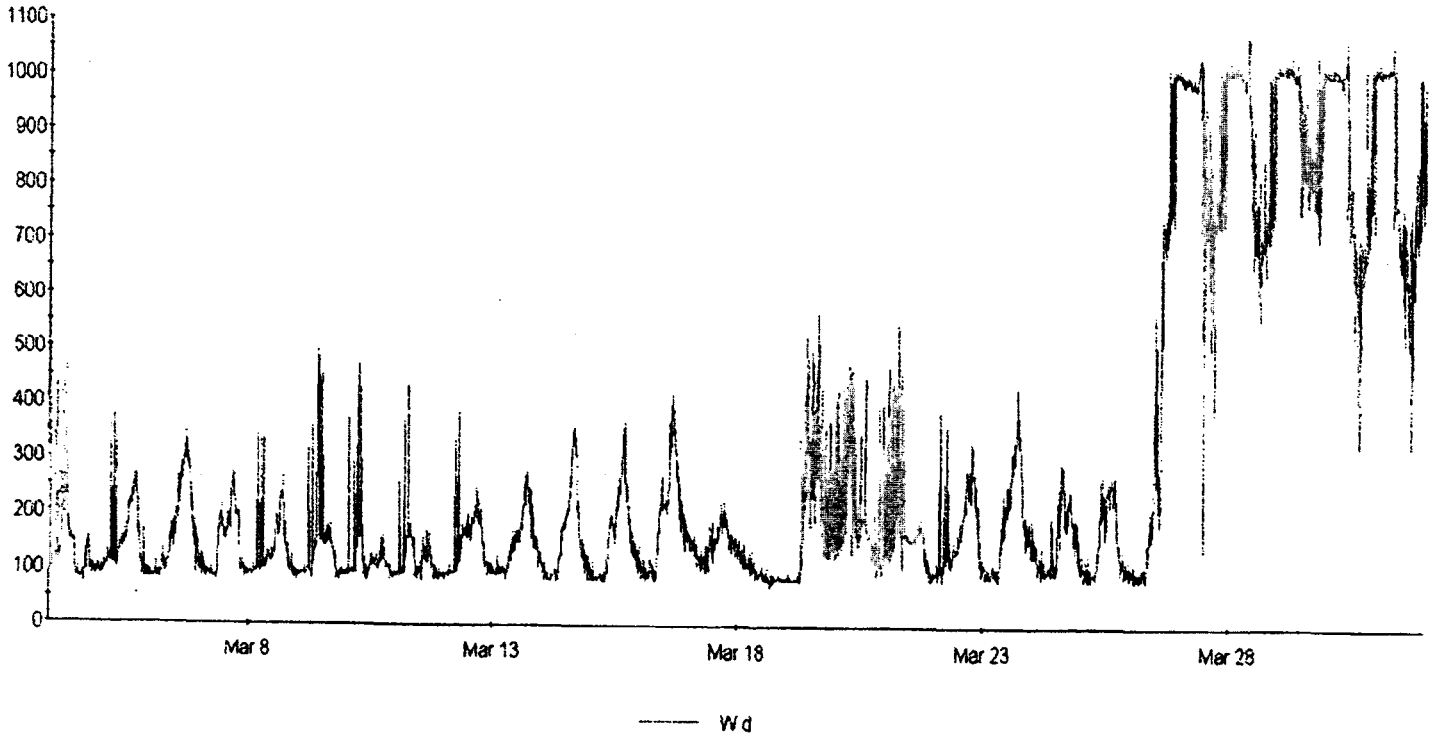
2046 REV 2/23/04

Exhibit

"B"

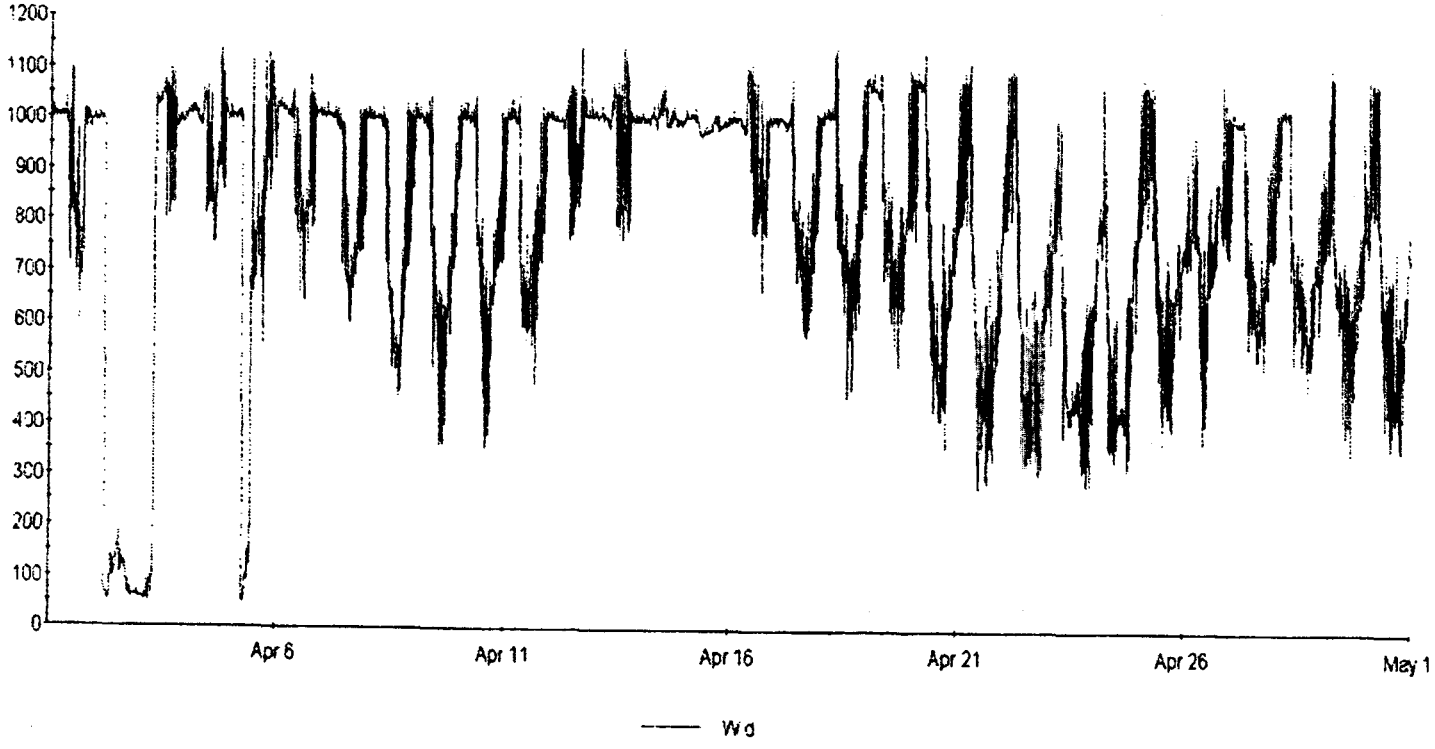
Load Profile Demand Data

Unit ID: 63989553
3/3/2012 - 4/1/2012



Load Profile Demand Data

Unit ID: 63989553
4/1/2012 - 5/1/2012



Load Profile Demand Data

Unit ID: 63989553
5/1/2012 - 6/1/2012