BEFORE THE KANSAS CORPORATION COMMISSION

OF THE STATE OF KANSAS

In the Matter of the Application of Southern Pioneer Electric Company for Approval of the Demand Response Peak Time Rebate Pilot Program.	))))	Docket No. 15-SPEE-357-TAR

PREFILED DIRECT TESTIMONY OF

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POWER SYSTEM ENGINEERING, INC.

ON BEHALF OF

SOUTHERN PIONEER ELECTRIC COMPANY

February 16, 2015

Q. Please state your name and business address.

A. My name is Steven A. Fenrick. My business address is 1532 West Broadway, Madison, Wisconsin 53713.

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

A. I am employed by Power System Engineering, Inc. ("PSE"). PSE was founded in 1974 and is a full-service consulting firm serving the utility industry. My title at PSE is "Leader, Economics & Market Research." I supervise the economics-related practice areas at PSE, including demand side management ("DSM") studies.

Q. What are your responsibilities with PSE?

A. I am responsible for many economics-related utility projects, including energy utility performance benchmarking, productivity analysis, value-based reliability planning, statistical cost modeling, load forecasting, survey and market research, and DSM activities. The group I head works with regulatory commissions, utilities, and customer advocate clients to provide economic and statistical analysis.

Q. Please briefly describe your educational and professional background as it relates to this project.

A. I have a B.S. degree in Economics from the University of Wisconsin-Madison. I also received an M.S. degree in Agriculture and Applied Economics from the University of Wisconsin-Madison. I have worked at PSE since 2009. Prior to my experience at PSE, I was at Pacific Economics Group (a utility industry consulting firm in Madison, WI) from 2001 until 2009, where I served as an Economist and later as a Senior Economist. I have published a number of academic journal articles on various topics within the electric utility industry.

Q. What is the purpose of your testimony?

A. Southern Pioneer Electric Company ("Southern Pioneer") is interested in piloting a

Demand Response ("DR") Peak Time Rebate ("PTR") Program (the "PTR Pilot Program") for residential customers, starting on June 1, 2015 and running through the end of August 2015. This testimony will describe the PTR Pilot Program and its value to the customers of Southern Pioneer.

Q. Who is Southern Pioneer working with to develop this Pilot?

A. Southern Pioneer was asked by its power supplier, Mid-Kansas Electric Company, LLC ("Mid-Kansas" or "MKEC"), to aid in developing a DR portfolio to help keep future power supply costs low. Subject to Kansas Corporation Commission ("KCC" or "Commission") approval, Southern Pioneer will partner with Mid-Kansas on this PTR Pilot Program.

Q. Will the costs to develop the PTR Pilot Program be shared between the Southern Pioneer and Mid-Kansas?

A. No, the costs necessary to implement and administer the 2015 PTR Pilot Program will be paid by Mid-Kansas. Southern Pioneer will pay its load ratio share of the costs of the proposed program through its wholesale power rate, yet such costs are minimal given the very limited and short duration of the proposed program. The potential future power supply cost savings justify Mid-Kansas' funding this PTR Pilot Program, as further described in my testimony.

Q. How will DR programs help keep power supply costs low?

A. DR programs reduce energy usage during high-cost, peak-demand periods; in some cases, that usage is shifted to other lower-cost periods. Thus, DR resources are programs that intentionally and predictably modify the system load shape in ways that will benefit Mid-Kansas and, by extension, the distribution member-utilities it serves. This resource can be used to substitute for future capacity needs; e.g., the need to construct generation capacity.

Q. Does Mid-Kansas project a capacity deficit in the future?

A. Yes. The driving force behind Mid-Kansas' interest in developing a DR resource is a projected generating capacity deficit starting in the year 2019 due to forecasted load growth and expiring power purchase agreements. Mid-Kansas, in conjunction with its sister company, Sunflower Electric Power Corporation ("Sunflower"), is currently investigating whether DR programs can be a least-cost resource that will offer power supply capacity at a lower cost than the alternatives, which are: (1) constructing new generation capacity or (2) purchasing capacity from third parties pursuant to contractual arrangements.

Q. Have the potential costs and benefits of conducting a DR program been investigated?

A. Yes. In 2012, Mid-Kansas and Sunflower engaged PSE to conduct a DR feasibility study and report the results. In that report, a number of DR options were investigated, along with associated cost-benefit tests. Based on that research and the continued projected capacity shortfalls beginning in 2019, Mid-Kansas is now moving to the pilot stage of its DR strategy. Accordingly, Mid-Kansas and Sunflower have requested that willing distribution member-utilities begin piloting certain programs during the summer of 2015, with the purpose of testing and evaluating whether DR can cost-effectively alleviate part of the upcoming projected capacity deficit and help keep power supply costs low for their distribution member-utilities.

Q. Please describe how a PTR Pilot Program works.

A. A PTR Pilot Program offers customers a financial reward for reducing their electricity usage during specific peak event hours. Customers who sign up for the program will be notified of peak event hours beforehand, either through text messaging, e-mail notices or both. It is then up to the participants to decide whether, and how much, to

react to a called peak event by curtailing their usage as desired. If customers do not reduce usage during peak hours, their bills are calculated as they were before the PTR Pilot Program. In other words, this PTR Pilot Program is entirely voluntary in nature, both in signing up and in reducing electricity use during specific events. At the end of the summer, the participants will receive a post-pilot survey. Once they return that survey, they will receive a rebate check that is based on how much electricity they curtailed during the peak events or $10, whichever amount is greater.

Q. What is Southern Pioneer asking participants to do during these peak event hours?

A. The PTR Pilot Program encourages customers to reduce as much electricity usage as they can during the peak events.

Q. Does this PTR Pilot Program require a change in the underlying KCC-approved retail electric rates charged by Southern Pioneer?

A. No. Electric rates will remain unchanged; therefore, if customers do not reduce usage during peak events, their bills are calculated the same as they were before the PTR Pilot Program was enacted. However, if customers do curtail their electricity use during the designated peak event hours, they financially benefit by receiving a rebate check.

Q. Can a participant be financially harmed if they opt-in to the PTR Pilot Program?

A. No. Regardless of customer behavior, the participants cannot be harmed by their enrollment in this PTR program. All electricity bills will be calculated exactly the same, whether on the program or not. The PTR Pilot Program participants will either receive a rebate check at the end of the summer or, if they did not reduce electricity use enough during peak events to earn $10, they will receive a $10 “thank you”

payment if they return the post-pilot participant survey.

Q. Will Southern Pioneer customers not participating in the PTR Pilot Program be financially harmed?

A. No. Non-participating customers will continue to be billed pursuant to the applicable KCC-approved retail tariffs. Furthermore, costs of the PTR Pilot Program will be paid by Mid-Kansas. The PTR Pilot Program costs are projected to be low, with the intention to develop a program that reduces power supply costs in the future for all customers. Southern Pioneer customers may experience a slight negative impact in the short-term, due to the PTR Pilot Program costs being rolled into the Mid-Kansas overall wholesale power costs, which are socialized and then passed on to each of the distribution member-utility on a corresponding load ratio share basis, thus eventually flowing through to the distribution member-utilities' retail customers in the form of the Energy Cost Adjustment. However, this impact will be minimal (especially given the fact that all costs are socialized among the Mid-Kansas distribution member-utilities) and with a likely long-term benefit.

Q. You mention that "PTR Pilot Program costs are projected to be low." Do you have an estimate of how much the Southern Pioneer PTR Pilot Program will cost Mid-Kansas?

A. Yes. The full costs of running the 2015 PTR Pilot Program for Southern Pioneer are estimated to be less than $40,000. This includes all mailing, recruitment, rebate, communication, and measurement and verification (M&V) costs. As I stated earlier, Mid-Kansas will sponsor the program and pick up the costs of the PTR Pilot Program.

Q. Please describe the process of when and how rebate checks will be calculated?

A. The rebates will be calculated after the end of August 2015, with one rebate check

being sent to each retail residential participant that was found to reduce its electricity use during peak events, based on the kWh reduction from the established baseline. Each participant receives a customized baseline, based on past usage and other factors. This baseline rebate calculation will be conducted by PSE using regression-based tools that adjust expected energy use based on variables such as hour of day, day of week, and weather conditions. Note that participants are paid for kWh reduction for all called peak events, even though the main benefit to Southern Pioneer and Mid-Kansas comes from kW reduction for one specific hour. This way, a customer does not have to "hit" the peak hour to receive a rebate; the customer is rewarded for effort in all called hours. This should keep customer reduction efforts high and increase satisfaction with the program.

Q. Are there other examples in Kansas of this type of baseline process?

A. Yes. This baseline methodology mirrors the successful procedure calculated by PSE and used by Heartland Rural Electric Cooperative in Eastern Kansas ("Heartland"). Heartland has successfully and fully deployed a PTR program as part of its "Peak Savers" DR program.

Q. Will the impacts of the PTR Pilot Program be studied after the PTR Pilot Program concludes at the end of August 2015?

A. Yes. The 2015 PTR Pilot Program impacts will be estimated by PSE and evaluated by Southern Pioneer and Mid-Kansas. Additionally, post-pilot surveys will be sent out requesting participant feedback on the program. This process will enable Southern Pioneer and Mid-Kansas to evaluate the potential impacts of the PTR program and determine the next steps moving to 2016 and beyond. If the 2015 PTR Pilot is successful, in 2016 Southern Pioneer can incorporate the lessons learned from the Pilot; and upon evaluation and approval of the KCC, it can extend and possibly

expand the program at Southern Pioneer.

Q. Will there be other DR pilots sponsored by Mid-Kansas at other distribution member-systems in 2015?

A. Yes. Mid-Kansas and Sunflower will be sponsoring a number of DR pilots starting in the summer of 2015. Other pilots on other distribution member-utility systems include residential PTR, small commercial and industrial PTR, and irrigation PTR. Collectively, these pilots will begin testing and evaluating whether DR can alleviate part of the upcoming capacity deficit and help keep power supply costs low for their distribution member-utilities.

Q. What is the recruitment strategy for the Southern Pioneer residential PTR Pilot Program?

A. Upon approval of the PTR Pilot Program by the KCC, PSE will randomly select and initiate direct mail to 1,000 Southern Pioneer residential customers who had at least 5,000 kWh of usage during 2014. In order to keep budget amounts low, the 2015 Pilot will be capped at 100 customers selected from the Southern Pioneer residential customer class. A participant pool of 100 will be large enough to meaningfully test and evaluate the impacts of the program.

Q. Will customers respond favorably to the recruitment and, ultimately, the PTR Pilot Program?

A. Yes, I believe so. A PTR Pilot Program will allow Southern Pioneer to better engage with its customers and offer a new product that will benefit them. In 2012, PSE conducted a survey for Sunflower and Mid-Kansas as part of their DR feasibility study. Southern Pioneer customers responded favorably to the idea of a PTR, with over 68 percent indicating a willingness to participate in such a program.

Other utilities around the country have implmeneted successful PTR programs. Most

notably, in eastern Kansas, Heartland, as mentioned previously, has a fully deployed PTR program as part of its Peak Savers DR program. This was initiated after PSE conducted a cost/benefit evaluation and helped design the PTR program. Heartland has run a fully deployed program for the last three years and has over 25 percent of its residential members signed up. From all accounts, its customers are satisfied with the program, which has enabled Heartland to save on power supply costs while at the same time providing its members with rebate checks.

Q. Who will be carrying out the recruitment and other program aspects of the Pilot?

A. PSE was engaged by Southern Pioneer and Mid-Kansas to mail informational letters, recruit participants, calculate rebates, call peak event days, communicate with participants, and perform M&V.

Q. What amount will the PTR Pilot Program participants be paid?

A. The incentives paid back to participating customers are set at $0.75 per kWh of reduction. This applies to any "called" event, whether or not it "hit" Southern Pioneer's peak.

Q. What will the amount of a rebate check be for a typical PTR Pilot Program participant?

A. Prior to collecting actual data indicative of the actual usage reduction, it is not possible to quantify the precise amounts of rebates. However, based on PTR programs at other utilities, we are anticipating an average response of around 0.3 kW reduction per event-hour for a participating customer. Using the anticipated average response rate for illustrative purposes, if 60 event-hours are called, which we have assumed in the cost-benefit analysis, during the summer the average participant would receive a rebate check of $13.50 (60 hours * 0.3 kW* $0.75/kWh).

Q. Besides the participants, who are the other possible beneficiaries of this PTR Pilot Program?

A. Mid-Kansas estimates the cost of constructing a new power plant to address the upcoming projected capacity deficit to be approximately $15 per kW/month. While a DR resource will vary based on its overall penetration, Mid-Kansas believes part of the projected capacity deficit can be reduced through DR, which has capacity costs that are approximately half those of a new power plant. Thus, DR programs will save money for all Mid-Kansas distribution member-utilities, including Southern Pioneer and its customers. The PTR Pilot Program is also likely to increase customer satisfaction, while at the same time helping to keep long-run power supply costs lower than they otherwise would have been. It is Southern Pioneer's belief that a PTR Pilot Program has the potential to offer Mid-Kansas a power supply resource that is far lower in cost than other alternatives. A PTR Pilot Program has the potential of being a strong value to all of Southern Pioneer's customers.

Q. Did you conduct a benefit-cost analysis of the full deployment potential of a PTR program at Southern Pioneer?

A. Yes.

Q. Please describe the assumptions that went into this analysis.

A. The cost-benefit tests for Southern Pioneer were calculated using a rebate amount of $0.75 per kWh reduction, estimated avoided power supply costs of $15 kW-month, and average "called" event hours of 60 per year. The cost-benefit tests were based on a full deployment scenario; i.e., PSE used Heartland's real-world participation rate of 25 percent residential customers and average kW impacts of 0.3 kW per participant. PSE is assuming the program will be energy-neutral; that is, any energy reduced by participants during peak events will result in higher energy use either prior to the peak

events (referred to as pre-cooling) or subsequent to the peak events (known as rebound cooling).

The cost-benefit tests have been put together from the perspective of Mid-Kansas, since it will be picking up the entire costs of the PTR Pilot Program and eventual full-scale program; and it also receives benefits in the form of lower power procurement costs. Southern Pioneer will eventually benefit through the lower power supply costs resulting from the PTR program and through other DR programs offered at other Mid-Kansas distribution member-utilities.

Q. What did the benefit-cost tests indicate?

A. A residential PTR program tends to be one of the most popular DR programs for participants. It also tends to have one of the best cost-benefit ratios because the program has low upfront costs and most of the program expenses end up in the participants' hands. Hence, this is likely to be a very cost-effective program, if it is eventually fully deployed. This is due to the fact that the primary cost of a PTR program is the necessary interval metering technology investment, known as Automated Metering Infrastructure ("AMI"); and Southern Pioneer already has made AMI investments by installing for the majority of retail customers. If fully deployed, much of the PTR program costs take the form of rebate checks to customers.

Q. What Commission-mandated benefit-cost tests were performed?

A. The benefit-cost ratios were calculated for the Total Resource Cost test (TRC), the Ratepayer Impact Measure test (RIM), and the Participant Test. Given the construction of the program, the RIM test is analogous to the Program Administrator Cost test (PAC or Utility Test). Regarding the Participant Test, each participant can only financially benefit or remain unaffected by the program; thus, the benefit-cost ratio is infinite as there are no tangible costs to the participants.

The TRC test is calculated by taking all of the benefits to Mid-Kansas and dividing by the non-participant costs. Rebate amounts flowing to participants are not counted as costs in this test because they are not "leaving the system," but are transfer payments from Mid-Kansas to the participants in recognition of their efforts to reduce electricity use during peak events. The RIM test looks at the impact of the non-participating customers of the distribution systems served by Mid-Kansas. This is a ratio of the benefits to Mid-Kansas to all of the program costs, including the rebates paid to participants.

Q. Where were the results for the TRC, RIM, and Participant tests?

A. The TRC test result of 6.8 shows that the net benefits outweigh the net costs by a ratio of 6.8 to one. The RIM test result of 2.5 indicates that the estimated benefits to non-participant ratepayers are 2.5 times the estimated costs of the program. As these tests indicate, a PTR program has the potential of being a strong value to all of Southern Pioneer's customers. Again, the participant test is infinite as there are no financial costs to participants.

Q. Can you show how these values were calculated?

A. Yes. The following table, Benefits of PTR at MKEC, shows the annual costs and benefits of the program as well as calculations of the benefit-cost tests discussed above. These calculations are for a full deployment scenario.

Benefits of PTR at MKEC		
Per participant reduction (kW)		0.3
Annual power supply value per kW ($15 kW-month * 12)	$	180
Value provided to MKEC per participant	$	54.00
Full deployment participation rate		25%
Number of residential consumers at S. Pioneer		12,990
Total PTR participants		3,248
Total kW reduced		974
Total Benefits per year to MKEC	$	175,365
Costs of PTR at MKEC		
Number of Event Hours		60
Rebate amount per kWh		$0.75
Rebate per participant		$13.50
Rebate and M&V calculation costs per participant		$5.00
Mailing and other communication costs per participant		$3.00
Total Costs to MKEC per participant		$21.50
Cost per kW-month		$5.97
Total Costs per year to MKEC		$69,821.3
Annual Net Savings	$	105,543.75
Ratepayer Impact Test Benefit-Cost Ratio		2.5
Total Resource Test (participant rebates excluded in costs)		6.8
Participant Test		All benefits, no costs

Q. Is there a PTR Pilot Program-specific tariff schedule?

A. Yes. Southern Pioneer's associated proposed tariff schedule, 2015-DR, is enclosed in its Application to the KCC as Exhibit 2.

Q. Do you have any concluding remarks?

A. Yes. A PTR Pilot Program of voluntary and limited scope is in the interests of Southern Pioneer's customers. Testing this PTR Pilot Program and verifying the

likelihood of positive benefit-cost ratios is a prudent and measured step. Given the willingness of Mid-Kansas to fund the PTR Pilot Program expenses, which are likely to be relatively low, along with the fact that DR may play an integral future role in keeping long-term power supply costs lower than they otherwise would be, a residential PTR Pilot Program in 2015 presents an opportunity for Southern Pioneer to greatly benefit, with very limited downside risks.

Q. Does this complete your testimony?

A. Yes.

VERIFICATION

STATE OF MINNESOTA)
) ss
COUNTY OF ISANTI)

The undersigned, Steven Fenrick, upon oath first duly sworn, states that he is an employee of Power System Engineering, Inc., and that he has prepared the foregoing testimony, that he is familiar with the contents thereof, and that the statements contained therein are true and correct to the best of his knowledge and belief.

Steven Fenrick

Subscribed and sworn to before me this 16th day of February, 2015.

Marilyn M. Cuellar
Notary Public

My appointment expires: 1/31/20

MARILYN M. CUELLAR
NOTARY PUBLIC - MINNESOTA
My Commission Expires Jan. 31, 2020