In the Matter of the Applications of Westar Energy, Inc. and Kansas Gas and Electric Company for Approval to Make Certain Changes in their Charges for Electric Service.	))))	17-WSEE-147-RTS

STAFF DIRECT TESTIMONY

PREPARED BY

LEO M. HAYNOS

UTILITIES DIVISION

KANSAS CORPORATION COMMISSION

April 11, 2017

Q. Would you please state your name and business address?

A. My name is Leo M. Haynos. My business address is 1500 Southwest Arrowhead Road, Topeka Kansas, 66604.

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

A. I am employed by the Kansas Corporation Commission (Commission) as the Chief Engineer.

Q. Please state your educational and employment background.

A. I received a Bachelor of Science Degree in Petroleum Engineering from New Mexico Institute of Mining and Technology, Socorro, New Mexico. I have worked in various capacities as an engineer for the past 34 years, primarily in the oil and gas industry. I am licensed as a professional engineer in the State of Kansas. For the past 18 years, I have worked for the Kansas Corporation Commission where I have been responsible for several functions including managing the pipeline safety program and the administration and enforcement of the underground utility damage prevention program. Prior to working for the Commission, I worked three years as an engineer for the Kansas Department of Health and Environment, Bureau of Air and Radiation and 13 years with Atlantic Richfield Corporation.

SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony?

A. In this Docket, Westar Energy Inc. (Westar or Company) has provided testimony on the status and success of its Electric Distribution Grid Resiliency (EDGR) pilot program. My testimony provides Staff's perspective of the EDGR pilot project and offers recommendations regarding future projects of this type.

Q. Please provide a brief history of the EDGR initiative.

A. The EDGR program was introduced as a proposal by Westar in Docket 15-WSEE-115-RTS (115 Docket).[1] The program had three overall concurrent initiatives:

- a comprehensive review of Westar's distribution system to identify and prioritize assets in need of replacement or modernization;
- replacement of assets nearing the end of their useful life; and
- the addition of equipment such as Supervisory Control and Data Acquisition (SCADA) components to improve the efficiency of system operations.

Q. What was the scope of the project proposed in the 115 Docket?

A. In the 115 Docket, the EDGR program was defined as a 15 year program requiring an investment of $887 million that would be recovered through an alternative ratemaking mechanism; however, Westar only requested the Commission approve the first phase of the EDGR program for $217 million. The phase 1 investment was to be completed in a five year period for an average annual capital expenditure of $43 million.

Q. Did Staff agree with Westar's proposal in the 115 Docket?

A. Staff did not support recovery of the costs of EDGR through the use of a rider. However, based on Westar's concern for the condition of its infrastructure, Staff agreed that not only was a program to address aging electric infrastructure appropriate, but the Commission should require Westar to undertake such a program.

Q. What was the scope of the EDGR program that was approved by the Commission in the 115 Docket?

A. The Commission ultimately approved a pilot EDGR project based on the terms contained in a Joint Settlement Agreement proposed by the parties in the 115 Docket. The pilot

[1] Docket Number 15-WSEE-115-RTS, Direct Testimony of Westar witnesses Jay Cummings and Bruce Akin.

allowed Westar to include in an abbreviated rate case up to $50 million of capital investment in EDGR related projects that were to be completed by March 1, 2017.

Q. Regarding the EDGR pilot, did the settlement agreement in the 115 Docket include any additional requirements?

A. Yes. The improvement projects were required to be consistent with the EDGR proposal in the 115 Docket, and the agreement directed Westar to work with Staff to develop a process for educating Staff on the projects selected and the ongoing status of each of the investment categories.

Q. Did Staff and Westar meet on a regular basis throughout the pilot project?

A. Staff and Westar met at least quarterly during the pilot project. In those meetings, Westar presented the projects they had selected to pursue as part of the pilot and we discussed their reasons for the selection, the anticipated benefits from the scheduled investment, potential metrics to measure and demonstrate project success, and the progress of each project.

Q. What were the categories selected for investment by Westar?

A. Westar selected nine categories for the EDGR pilot. The nine categories can generally be classified as either overhead line projects or substation improvement projects. Westar witness, Martin Jones, includes Table 1 in his testimony, which identifies the projects and the capital expenditure as of October 15, 2016. In the following table (Table LMH-1), I have included a copy of Mr. Jones' table but updated the investment amounts to reflect February 20, 2017, totals.[2] I have also added notes based on Staff discovery regarding each project.

[2] Response to Staff Data Request 19.

Table LMH-1

Focus Area	Updated Cap. Expend. as of 2/20/17	Notes
Overhead Line Projects		
Pole Replacements	$9.0 million	1650 poles replaced, 1338 trussed; 27,424 inspected = 11% remediation rate.[3]
Comprehensive Circuit Rebuild (Quinton Heights Project)	$8.7 million	$5.9 million of costs (69%) due to 804 pole replacements and transformer replacements.[4]
Circuit Ties and Overhead Line Rebuilds	$10.6 million	607 poles replaced for $3.0 million (29%) of total project costs.[5]
Substation Improvements		
34.5/12.47 kV Substation Rebuilds	$5.5 million	10 substation rebuilds; $550,000 per station.[6]
Substation Recloser/Breaker Replacements	$5.3 million	77 breakers installed; $69,000 per breaker.[7]
Underground Direct Buried Getaway Replacements	$8.2 million	60 getaways in 25 substations replaced; project exploration costs estimated to be $410,000; replacement costs = $137,000 per getaway.[8]
Spare Substation Transformers	$1.7 million	3 transformers at $556,000 each.[9]
Communicating Fault Indicators	$2.0 million	1500 installed at $1,331 each.[10]
Substation Wildlife Protection	$159,571	2 substations at $80,000 each.[11]
Total	$51.0 million	

Q. Do you believe the projects or project categories selected were appropriate?

A. Yes. Westar developed a formal process for prioritizing potential projects. The process scored six parameters to develop an overall score for a proposed project. The parameters

[3] Response to Staff Data Request 23.
[4] Response to Staff Data Request 29, (calculated costs include allocated share of overhead loadings).
[5] Response to Staff Data Request 25. Estimate revised after email correspondence with Staff.
[6] Response to Staff Data Request 19.
[7] Response to Staff Data Request 19.
[8] Response to Staff Data Requests 27,41, and 42.
[9] Response to Staff Data Request 19.
[10] Response to Staff Data Request 19.
[11] Response to Staff Data Request 19.

capable of having the greatest impact on the prioritization methodology were the number of customers that would benefit from the project and the impact of the project on the performance of the circuit.[12]

Q. How close did the actual expenditures match Westar's estimates for the pilot?

A. On an individual category basis, at least two of the categories, pole replacements and circuit ties/rebuilds, had costs that were significantly different than original estimates. For pole replacements, the actual expenditure was 25% less than the budget estimate, while the actual expenditure for circuit ties and rebuilds was 75% greater than the budget estimate. [13]

Q. Is the difference between the cost estimate and actual project cost a concern?

A. No. The settlement agreement limited the total dollar amount that could be spent on EDGR related projects to $50 million, but it did not restrict the investment to any specific category of project. With the short time frame in which to develop estimates and complete the work, and the fact that this project is a demonstration pilot, I believe the differences between estimated costs and actual costs are reasonable.

Q. What benefits did the pilot project provide for Westar ratepayers?

A. Intuitively, customers served by the facilities that have been updated should see an improvement in reliability. For the projects related to SCADA improvement, quantifiable results could be measured as manpower savings from outage responses, as well as improved reliability. But with the work being just completed, it is not possible to quantify the impact of the investment on reliability.

[12] Response to Staff Data Request 36.
[13] Response to Staff Data Request 19.

Q. How long do you estimate it will take before the impact on reliability can be quantified?

A. In my opinion, weather conditions, system maintenance, and system usage are the factors that test the reliability and resiliency of an electric distribution system. Because weather extremes only occur a few times per year, I would estimate that it will take at least three years of data to provide quantifiable results of system reliability improvement.

Q. Do you believe the EDGR pilot was a success?

A. As noted above, quantifiable success is yet to be measured. But I believe the process of selecting and prioritizing projects for EDGR, monitoring the construction progress, and tracking project costs was a success. Using the knowledge gained from the implementation of the pilot should provide valuable feedback in planning future infrastructure replacement projects.

Q. Do you have additional observations regarding the EDGR pilot?

A. Yes. In my direct testimony in the 115 Docket, I recommended Westar complete a comprehensive inspection and inventory of its distribution system in order to develop a cost effective asset management plan before initiating a system-wide program similar to EDGR. I believe the pilot results offer support for that recommendation.

Q. **How do you define the asset management process?**

A. Asset management is a methodical process of using knowledge of an asset to develop a plan of action that can be tested and modified based on the results achieved. Such an approach requires sequential steps in order to determine if you are on the correct path. The first step in the process is the development of knowledge of your assets and management of that information to chart a course of action. Acting without having the

necessary information on failure rates or an accurate inventory of at-risk equipment may lead to misplaced focus and lower than anticipated impact on quality of service and equipment failure rates. I believe the results from the pilot represent a test of Westar's asset management program. The results provide a feedback loop that Westar can use to determine where to focus inspection programs and ultimately prioritize future replacement programs.

Q. Please explain how the pilot results support your recommendation for developing a system inspection and inventory before undertaking a system-wide project similar to EDGR.

A. I believe there are two readily apparent examples. One is the replacement of direct buried getaways in substations. In preparation for the project, Westar undertook an extensive review of its construction records for the 587 distribution substations in its system. Ultimately, they selected at least 86 substations as likely candidates having this type of obsolete equipment. However, they discovered only 25 substations with direct buried getaways needing replacement.[14] In the 115 Docket, Westar had estimated it would need $220 million to replace direct buried substation getaways as part of the 15-year, full EDGR project.[15] Based on the pilot results, the need for system-wide getaway replacement investment can probably be reduced as there may not be as many direct buried getaways needing replacement. On the other hand, the exploration effort looking for buried getaways demonstrated Westar has substantial inaccuracies in its records of buried substation facilities. Therefore, I would conclude the effort to develop an

[14] Response to Staff Data Requests 27 and 41.
[15] Docket 15-WSEE-115-RTS Response to KIC Data Request 2.02, Attachment 02-02-002 Westar Consolidated Work Papers Master Tab, cell D48.

accurate inventory of the facilities buried in substations should continue. In the process, it may also discover more getaways in need of replacement.

Q. What is your second example of the pilot results supporting your recommendation for developing a system inspection and inventory before undertaking a project similar to EDGR.

A. My second example of the pilot providing feedback on future investment and the need for accurate records is the category of pole replacement. For the overhead line project categories in the pilot, it appears that $16.7 million or 59% of the total overhead projects was needed for pole replacement or repairs.[16] In the 115 Docket, the proposed 15-year EDGR program included $315 million for overhead line project categories[17] of which $81 million (26% of total overhead line project costs) was directly related to pole replacement[18]. If the percentage of pole replacement related to overhead line investments seen in the pilot project is applied to the complete 15-year EDGR overhead line project category, the cost of pole replacement would be $186 million or 2.3 times the estimated full EDGR program pole replacement cost. With 589,000 distribution poles,[19] the potential cost to replace and remediate poles could be significantly greater than the original full project EDGR estimate. Considering this issue, I would recommend Westar complete its ongoing wood pole inspection program and incorporate the results into its replacement prioritization methodology as part of an ongoing infrastructure replacement program.

[16] $8.25 million pole replacement plus $5.4 million Quinton Heights pole replacement plus $3 million for pole replacements for circuit ties = $16.65 million for poles divided by $28.3 million for overhead line projects = 59%.
[17] ibid. Master Tab, sum of cells D9, D11, D18, D19, D23, and D54.
[18] ibid. Master Tab, cell D11.
[19] Docket 16-KCPE-593-ACQ, Direct Testimony Walter P. Drabinsky, Exhibit WPD-15.

Q. What has been the historical performance of Westar's wood pole inspection program?

A. Table LMH-2[20], listed below, provides the historical performance of Westar's pole replacement program.

TABLE LMH-2

Year	Number of Poles Inspected	% of Poles Identified for Replacement	% of Poles Treated	% of Poles Identified for Trussing
2011	0	n/a	n/a	n/a
2012	0	n/a	n/a	n/a
2013	24,667	2.6%	76.4%	8.4%
2014	11,565	2.0%	77.8%	4.9%
2015	26,522	6.7%	74.9%	7.3%
2016 (EDGR)	27,424	6.0%	82.8%	5.2%
Average/year	22,545	4.3%	78.0%	6.4%

Q. Do you believe the rate of pole inspection is appropriate?

A. In my opinion, the rate of inspection appears to be low. Westar has 589,000 poles of which 60% are at least 30 years old.[21] At an average inspection rate of 22,500 poles per year, it would take 16 years just to inspect the 30 years and older poles. For the complete pole inventory, an inspection cycle at this rate would take 26 years.

Q. What is the appropriate inspection cycle for wooden distribution electric poles?

A. An inspection cycle would have to be designed for a specific company to take into account the need for more frequent inspections for problem poles or for poles that have

[20] Response to Staff Data Requests 24 and 40.
[21] Docket 15-WSEE-115-RTS, Direct Testimony of Bruce Akin, page 14, line 17.

been repaired; however, Staff research suggests a pole inspection cycle for this area of the country should be every 10-12 years.[22]

Q. What is your opinion of Westar's performance in completing the EDGR pilot?

A. In my opinion, the EDGR pilot has demonstrated that Westar has the expertise and personnel to undertake a major infrastructure replacement program while closely managing a budget for each line item in the program. In fact, I believe their performance in carrying out this task under the given time constraints was exemplary. I also believe the infrastructure replacement prioritization methodology is a reasonable approach to addressing those facilities presenting the greatest risk to customer safety and reliability.

Q. Does Staff have any evidence that Westar's distribution system is unreliable?

A. No. While Staff has observed anecdotal evidence of poorly maintained or unsafe infrastructure[23] in Westar's distribution system, we have no widespread evidence that would lead us to conclude Westar's system is unreliable.

Q. Has Westar presented any evidence that would lead you to conclude its electric distribution system will experience a reduction in reliability in the future?

A. Westar has not provided Staff with any analysis of historical trends that demonstrate an increased equipment failure rate; however, statements from Westar senior management and subject matter experts believe that to be the case. In the 115 Docket, the direct testimony of Westar's senior vice president of power delivery, Bruce Akin, indicates that equipment failures are highly correlated to the age of its system and that Westar is

[22] Gerald L. Dougherty, http://www.osmose.com/documents/realistic-expectation-of-in-place-wood-pole-inspection-program.pdf.
[23] Response to Staff Data Request 45. See also Docket 15-WSEE-580-COM, Paras. 26-27, Response to Staff's Report and Recommendation of Westar Energy, Inc.

experiencing an increase in equipment failures in recent years.[24] Also in the 115 Docket, Westar expert witness, Jeff Cummings, estimates that without a systematic strategy to address aging infrastructure, Westar customers will experience an additional 250,000 to 500,000 interruptions per year.[25]

Q Do you believe the Commission should consider providing Westar with an incentive to perform infrastructure replacement as proposed in the 115 Docket?

A. In the 115 Docket, Staff did not support recovery of the costs of EDGR through the use of a rider. Regardless of the rate recovery mechanism, I believe the pilot has demonstrated Westar's concerns for its aging infrastructure are valid and must be addressed. As I stated in my Direct Testimony in the 115 Docket, I recommend the Commission require Westar to continue an infrastructure replacement program. For the years 2013 through 2016, Westar spent an average of $42.5 million on infrastructure improvement projects. [26] I believe an expansion of that annual investment is warranted, but at a minimum, the Commission should require Westar to maintain its level of capital spending on infrastructure projects at an investment level equal to the average of the last three years. As part of that effort, I would also recommend Westar continue its aggressive investigation into the condition of its power poles and incorporate this information into its asset management program.

Q. Do you recommend Westar continue to coordinate with Staff regarding its infrastructure replacement plans?

A. Yes, I do. In my opinion, the regularly scheduled meetings between Westar and Staff to discuss the pilot project were beneficial to both parties. The meetings educated Staff on

[24] Docket 15-WSEE-115-RTS, Bruce Akin Direct Testimony, lines 15-22, page 14 and lines 8-10, page 16.
[25] Docket 15-WSEE-115-RTS, Jeff Cummings Direct Testimony, page 4, Exhibit JC-1.
[26] Response to Staff Data Request 40.

the project's progress and any new findings that occurred as part of the construction project. Similarly, the meetings provided Westar with the opportunity to understand any concerns Staff may have within the context of sufficient and efficient implementation of the project.

Q. Does this conclude your testimony?

A. Yes.

STATE OF KANSAS)
) ss.
COUNTY OF SHAWNEE)

VERIFICATION

Leo M. Haynos, being duly sworn upon his oath deposes and states that he is the Chief Engineer for the Kansas Corporation Commission of the State of Kansas, that he has read and is familiar with the foregoing *Staff Direct Testimony*, and attests that the statements contained therein are true and correct to the best of his knowledge, information and belief.

Leo M. Haynos
Chief Engineer

Subscribed and sworn to before me this 11th day of April, 2017.

VICKI D. JACOBSEN
Notary Public - State of Kansas
My Appt. Expires 6-30-18

Vicki D. Jacobsen
Notary Public

My Appointment Expires:

6-30-18

CERTIFICATE OF SERVICE

17-WSEE-147-RTS

I, the undersigned, certify that a true and correct copy of the above and foregoing Direct Testimony of Leo Haynos on Behalf of the Kansas Corporation Commission was served via electronic service this 11th day of April, 2017, to the following:

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