



April 25, 2017

Mr. Jeff McClanahan  
Director, Utilities  
Kansas Corporation Commission  
1500 SW Arrowhead Rd.  
Topeka, KS 66604-4027

**RE: Notice of Changes to Peak Load Forecast Model  
Docket No. 07-WSEE-616-PRE**

Dear Mr. McClanahan:

Westar Energy, Inc. and Kansas Gas and Electric Company (both doing business as Westar Energy) hereby submits the attached memorandum notifying the Commission of a change to the Peak Load Forecast Model that was developed as part of the settlement in Docket No. 07-WSEE-616-PRE.

Please contact me at 575-6422 with any questions concerning this filing.

Sincerely,

Scott Unekis  
Regulatory Economist

Enc.  
cc: Robert Glass

## Memorandum

To: Chairman Pat Apple  
Commissioner Shari Feist Albrecht  
Commissioner Jay Scott Emler

From: Robert Glass, Ph.D., KCC Staff  
Lana Ellis, Ph.D., KCC Staff  
Darren Prince, KCC Staff  
Scott Unekis, Westar Energy  
John Cita, Ph.D., Westar Energy  
Larry Wilkus, Westar Energy

Date: April 25, 2017

### Background

On June 11, 2007, the Commission approved a Stipulation and Agreement (“S&A”) entered into by Westar Energy, Citizen’s Utility Ratepayer Board (“CURB”) and Commission Staff (Docket No.07-WSEE-616-PRE). One requirement of the S&A was development of a Peak Load Forecast model and underlying data set that would be mutually acceptable to Westar Energy (Westar) and Staff.

On January 17, 2008, the Commission received a Memorandum submitted by Staff and Westar officials that indicates compliance with that requirement. That Memorandum also states (at page 4):

“Any necessary changes to the [peak load forecast] model will be assessed jointly by Staff and members of Westar management. Any and all changes that are jointly agreed to will be presented to the Commission. If modeling changes cannot be jointly agreed to, the Commission shall be apprised of those changes as well.”

### Current Matter at Hand

Westar Energy’s peak load forecasts are updated annually, typically prior to November. At the time updates are made, Westar also explores potential changes to model specification for the purpose of improving forecast accuracy. And for this purpose, various statistics are examined: Breusch-Godfred test for serial correlation of residuals, MAPE (mean absolute percentage error) for forecast accuracy, AIC (Akaike Information Criteria) test for model selection, and SER (standard error of regression), again, for

forecast accuracy. The latter is of importance given forecasting is the primary, if not sole, purpose of model development.

The latest forecast model (developed Fall 2016) embodies two changes (in the form of added variables) to prior model. It also embodies three modifications to the prior model. First, the two changes:

1. Inclusion of the MCPREFINE\_PO variable. This is a binary variable indicating days when the refinery at McPherson is significantly derated (effectively shut).
2. Inclusion of Frontier\_COGEN variable. This is another binary variable flagging those days when the Frontier Refinery is generating energy (behind-the-meter) at or near the indicated capacity of its generating unit.

The three modifications (or re-specifications) are:

3. More sub-season dummy variables. The prior model had eight sub-season dummy variables, seven that were explicit. In the current model the respective counts are thirteen and twelve.
4. In the prior model, Average Daily Temp was included as only a lagged variable, with both one and two period lags. In the present model, it is included without any lag.
5. In the prior model, distribution events (which represent interruption of load due to various distribution system issues) was included without a time lag. In the present model, it is also included with a one period lag.

All changes and modifications are largely driven by their influence on the SER and the AIC statistic. Last year's model had a SER of just over 109 (MW); the current model's SER is just over 106 (MW). Since the model in question is used exclusively for forecasting, having a focus on the SER is probably reasonable.

#### Resolution of Current Matter and Compliance Report to Commission Staff

These changes and modifications were presented and discussed in a meeting that occurred April 14, 2017. Westar officials at that meeting included: Scott Unekis, Larry Wilkus, and Dr. John Cita. KCC Staff attendees were: Dr. Robert Glass, Dr. Lana Ellis, and Darren Prince.

All authors of this Memorandum understand the proposed changes provide a basis for greater forecasting accuracy (as indicated by certain test results) and, therefore, find them acceptable. Moreover, these changes do not destabilize the overall forecasting process and simply represent marginal changes that can be expected to occur as underlying conditions change (including historical data sets) and/or with ongoing efforts to enhance model forecast performance over time