FORECASTING PANEL – REBUTTAL
ELECTRIC

Q. Please state the names of the panel members.

A. Margaret M. Lenz, Patrick F. Hourihane and Hock G. Ng ("Forecasting Panel").

Q. Have you previously submitted direct testimonies in this proceeding?

A. Yes, we have.

Q. What is the purpose of your rebuttal testimony?

A. Our rebuttal testimony responds to the direct testimonies of State of New York Department of Public Service witnesses Anping Liu and the Staff Rate Panel ("Staff testimonies") and the City of New York witness Harvey Arnett ("City's testimonies") relating to their adjustments to the Company's sales and revenue forecasts.

STAFF TESTIMONIES

Q. Have you reviewed Mr. Liu's proposed adjustments to your sales volume forecast?

A. Yes.

Q. What are Mr. Liu's adjustments?

A. He proposed an upward adjustment of about 220 gigawatthours (GWH) to our sales volume forecast for the rate year ending March 2009 by making changes in the following five areas:

(1) He introduced a real personal income variable as an independent variable in the forecasting models for service classes (SC) 1 and 7.

(2) He removed a dummy variable for the third quarters of 2005 and 2006 in the forecasting model for SC 1.

(3) He increased the forecasted number of customers for SC 1, SC 2 and SC 7 by 1,892, 553 and 177, respectively, for the rate year ending March 2009.

(4) He increased the Company's normal cooling degree-days.

(5) He replaced the price deflators used to obtain the real price of elasticity.

Personal Income Variable

Q. How did Mr. Liu introduce a personal income variable in the sales forecasting models for SC 1 and SC 7?

A. Mr. Liu summed the annual Total Nominal Personal Income for the five New York boroughs and Westchester, divided the sum by the Consumer Price Index for All Urban Consumers (CPI-U) to get Real Personal Income, and divided that result by Population to get Per Capita Real Income. Mr. Liu then converted the annual figures to

quarterly figures using EView's "quadratic averaging conversion" option.

Q. Please explain why you disagree with Mr. Liu's use of the Personal Income variable.

A. The use of a personal income variable, especially real disposable personal income, is theoretically sound. However, real disposable personal income for the Company's service area is not available, while data on personal income and population are available only on an annual basis and with up to a two-year lag. This necessitates the construction of the quarterly historical data for Per Capita Real Income, which leads to the introduction of estimation errors in two ways. First, the method for converting the annual figures to quarterly figures is arbitrary and may not reflect the actual quarterly figures. Second, the actual annual data is available only through 2005, while the sales volume forecasting models are estimated for the period from the first quarter of 1981 through the fourth quarter of 2006. Hence, data on real income for 2006 had to be estimated. Without knowing how the accuracies of the sales volume forecasting models are affected by the use of estimated

data, it is difficult to place confidence in the forecasts produced.

Dummy Variable in SC 1 Model

Q. Please explain Mr. Liu's disagreement with the use of the dummy variable in the sales forecasts for SC 1.

A. The dummy variable was included in the SC 1 forecasting model to account for the exceptional response of sales to the unusual weather conditions in the third quarters of 2005 and 2006. We had provided an analysis in our response to Staff 11(2) and 167 to show that daily sendout was more responsive to changes in cooling degree days (CDD) during the days when the daily CDD was high in the third quarters of 2005 and 2006. Mr. Liu provided arguments that this analysis does not support the inclusion of the dummy variable.

Q. What are his arguments?

A. His first argument was that the analysis was for total sendout, not SC 1. He pointed out that SC 1 sales were only about 26 percent of sendout and that the models for the other service classes did not include this dummy variable. He took the absence of the dummy variable from the other models as suggesting that the impact of the

unusual weather in the third quarters of 2005 and 2006 can be explained by the weather variables in the model.

Q. Do you agree with this?

A. No. Actually, Mr. Liu's observations support our findings that SC 1 sales are much more responsive to unusually hot weather conditions than sales of the other service classes. The fact that there is a significant increase in the responsiveness of sendout to changes in CDD during high-CDD days even though the other service classes did not exhibit significant changes in their responses indicates that the change in the response of sendout was mostly due to exceptional response in SC 1 sales. Furthermore, since SC 1 sales is only about 26 percent of sendout, the increase in SC 1 sales due to unusually hot weather conditions must have been very large to cause sendout to show a significant change on very hot days.

Q. What other argument did he provide?

A. His second argument for the removal of the dummy variable was that the change in responsiveness of sales to weather was a result of a surge in the saturation of cooling appliances, and that the level of responsiveness will not

go down when weather returns to normal. He implied that since the level of responsiveness will remain elevated the dummy variable should not take on value of 0 in the future.

Q. Do you agree with this?

A. No. This argument is not supported by evidence and is misleading. First, Mr. Liu did not define what he meant by a "surge" or explain how he came to the conclusion that there was a "surge" in the saturation of cooling appliances. He also did not provide any data or study to support his claim that "the level of responsiveness will not go down when weather returns to normal." Appliance saturation rates only measure the number of units of cooling appliances that each household owns, not if, or how often, the appliances are actually used. Even if the saturation rates of cooling appliances had increased, it does not necessarily follow that consumers will use the added cooling appliances when weather is normal. Second, Mr. Liu confused the exceptional response of sales to an unusual event with a change in responsiveness of sales. The dummy variable captures the exceptional sales response in the third quarters of 2005 and 2006, not the

change in responsiveness of sales to weather changes. The responsiveness of sales to changes in weather during normal conditions is already captured by the weather variables included in the model. A change in the saturation rate would affect the base load and, therefore, the constant term of the model. The exceptional response of sales to unusual weather like that experienced in the third quarters of 2005 and 2006 is the result of more than a change in the saturation rate of cooling appliances, and is temporary in nature. The Company's sales forecasting model for SC 1 is dynamic in nature and includes ARIMA terms. The dummy variable is included merely to prevent the ARIMA terms in the model from carrying the temporary effect of unusual weather over into the forecast period when weather is assumed to be normal.

Q. What analysis did Mr. Liu provide to support the removal of the dummy variable?

A. Mr. Liu re-estimated the SC 1 sales volume forecasting model on a shortened sample through the fourth quarter of 2005, and used it to provide ex-post forecasts of sales in the third quarter of 2006 under three scenarios. In

the first scenario, he included the dummy variable and assigned it to take a value of 0 in the third quarter of 2006. In the second scenario, he also included the dummy variable, but assigned it to take a value of 1 in the third quarter of 2006. In the third scenario, he excluded the dummy variable from the model. His results, depicted in page 1 of his Exhibit ___ (AL-2), show that the first scenario produced the forecast that is furthest from the actual sales, while the second scenario produced the forecast that is closest to the actual sales. He inferred from these results that the Company's approach produced the "worst" forecast. In spite of the second scenario's best performance, he went on to recommend that the approach in the third scenario be adopted by arguing that "the dummy variable may assume some value between 0 and 1."

Q. Do you agree with Mr. Liu's analysis?

A. No. Mr. Liu's analysis does not correctly interpret the use of the dummy variable. A dummy variable takes on a value of 1 when the special event it is designed to capture is present, and a value of 0 if the event is not present. It is not meant to take on intermediate values

because the special event is either present or it is not. Impacts of any change in appliance saturation rates are picked up by the constant term.

Q. Does Mr. Liu's statistical analysis support the removal of the dummy variable?

A. No. In page 8 of Mr. Liu's testimony, he incorrectly attributes the first scenario as the Company's approach. In our forecasting model for SC 1, the dummy variable takes on a value of 1 in the third quarter of 2006 because unusually high CDD days were present in that period. Thus, the Company's approach is represented by the second scenario, where the dummy takes on a value of 1 in the third quarter, which produced the best forecast. Mr. Liu's ex-post forecasting results only show that our model with the dummy variable to capture the impact of usual weather in the third quarters of 2005 and 2006 produces a better forecast for the third quarter of 2006 than the model without the dummy variable. Thus, the dummy variable should be retained. The Company's rationale for assigning a value of 0 to the dummy variable in future years is that weather is assumed to be normal.

Forecast of Number of Customers

Q. Mr. Liu adjusted the forecasted number of customers SC 1, SC 2 and SC 7 by 1,892, 553 and 177, respectively, for the rate year ending March 2009. Do you agree with these adjustments?

A. No. Mr. Liu has not shown that his model for the number of SC 1 customers is better than the Company's model. He claims that his model for the SC 1 number of customers is superior in both goodness-of-fit and forecast evaluation, but he does not explain how it is better in goodness-of-fit. While the regression statistics shown in pages 3 through 4 of Mr. Liu's workpapers indicate that his model for the number of SC 1 customers (NC01) has a higher R^2 value than the Company's model, it should be noted it is not valid to use R^2 as a basis to compare goodness-of-fit in this instance because the two models have different dependent variables. Staff's model has NC01 as the dependent variable while the Company's model has the year-on-year difference in NC01 as the dependent variable. Valid criteria for model comparison in such a situation include loglikelihood, Akaike Information Criterion (AIC), and Schwarz Criterion (SC). The

regression statistics indicate that the Company's model has higher loglikelihood, lower AIC and lower SC, all of which indicate that the Company's model has a better fit.

As for forecast evaluation, Mr. Liu performed a two-year ex-post evaluation by estimating the Staff and Company models through the fourth quarter of 2004 and using the estimated models to forecast NC01 for the period from the first quarter of 2005 through the fourth quarter of 2006. The results shown in pages 3 through 4 of Mr. Liu's workpapers indicate that his model performed better in terms of Root Mean Squared Error, Mean Absolute Error, and Mean Absolute Percent Error. The results are reversed, however, when the same analysis is performed using a three-year ex-post evaluation. By estimating the models through the fourth quarter of 2003 and using the estimated models to forecast NC01 for the period from the first quarter of 2004 through the fourth quarter of 2006, the results indicate that the Company model performed better based on the same forecast evaluation criteria. These results are shown in Staff's response to the Company's Information Request CONED-51, titled by Staff

as “Attachment to Staff Response to Con Edison IR-53” and attached here as Exhibit ___ (FP-4).

MARK FOR IDENTIFICATION AS EXHIBIT __ (FP-4)

Normal Weather

Q. Do you agree that the normal CDD should include normal CDD for all months as Mr. Liu asserts, not just for the months of May through October?

A. No. CDD is used as a measurement to capture the impact of weather on customers’ use of air conditioning appliances, which normally occurs in the period from May through October. While it is possible to have CDD outside the May through October period, the incorporation of these CDD in the normal is inconsistent with the practice of the experts at the National Weather Service Bureau. The 30-year average is smoothed so that normal CDD shows a gradual increase as we enter summer and a gradual decrease as we enter fall. This leads to negligible levels of CDD for each day outside the May through October period. For example, when the total 30-year average CDD of 15 for April is smoothed out over the thirty days of the month, the normal CDD for each day is about 0.5. It is not realistic to assume that customers

will turn their cooling appliances on when there is only 0.5 CDD.

Price Deflators

Q. What adjustments did Mr. Liu make to the electric price variables?

A. Mr. Liu replaced the price deflator that the Company used to calculate the real electric prices with the Consumer Price Index for All Urban Consumers and the GDP Price Index in the calculating the real electric prices for residential customers and the commercial and industrial customers respectively.

Q. Do you agree with these adjustments?

A. The changes in price deflators that Mr. Liu proposed are acceptable. The effect on the sales forecast of changing the price deflators alone, however, is minimal. The Company's total sales volume would decrease by only 1 GWH if all the real electric price variables were replaced by those that Mr. Liu proposed, keeping everything else in the models unchanged.

Price Out of Staff's Sales Forecast

Q. Have you reviewed the Staff Rate Panel's proposed price out of Staff's sales volume forecast?

A. Yes.

Q. Do you agree with the Staff Rate Panel's proposed revenue adjustment of $18.4 million given Staff's sales adjustments?

A. No.

Q. Please explain.

A. Staff used the Company's pricing models to determine the Con Edison delivery revenue forecast associated with their sales forecast. They used these models correctly. However, we disagree with the sales and demand forecasts that Staff applied to the pricing equations.

Q. Didn't Staff apply the sales forecast recommended by Mr. Liu?

A. The sales forecast used in Staff's revenue forecast is 10 GWH higher than the level proposed by Mr. Liu.

Q. Are there any other issues with respect to Staff's pricing of the sales forecast?

A. Yes. The sales forecasting models developed by Mr. Liu determined total service class sales. For some service classes, such as SCs 4 and 9, total sales need to be further segregated between conventional and time-of-day due to different pricing structures. This allocation is

based on historical relationships. The Company provided Staff these allocation percents as part of an interrogatory response. However, Staff applied these percents to the final sales figures for these classes after taking into account DSM reductions, not to the sales figures prior to DSM reductions. Instead, Staff should have allocated the sales between conventional and time-of-day first, then deducted the DSM effect. By applying these percents to the final class sales, Staff assumed that the DSM measures will be in the same proportion as the conventional and time-of-day sales. This assumption does not hold true.

Q. What is the issue with the demand forecast?

A. Staff determined the demand forecast based on their final sales forecast after taking into account savings from proposed demand side management programs. However, the demand forecast should be determined by first applying the forecasted hours use to the sales forecast prior to the reductions due to DSM and then manually subtracting the estimated DSM savings.

Q. Had you assumed Staff’s sales forecast but modified it to reflect the correct treatment of the issues discussed

above, what impact would these changes have on the Staff's delivery revenue adjustment of $18.4 million?

A. Staff's delivery revenue adjustment of $18.4 million would be reduced to $12.4 million since Staff's delivery revenue forecast is overstated by $6.0 million.

Q. The Staff Rate Panel states in its testimony "Since the sales forecast takes into consideration the Company's revenue requirement, which is subject to change during the course of this proceeding, the level of sales, and the resulting revenues, will also be subject to change. Therefore, we propose that this adjustment be updated when Staff files its final brief in this proceeding." (pp. 28-29). Do you agree with this statement?

A. No, we do not. Staff made the erroneous conclusion that we factored into our sales forecast the price elasticity effect (or the customers' response to the increase in price) related to the rate increase requested by the Company in this proceeding. Not only does the forecasted real electric price exclude the proposed rate increase, it also excludes the actual increase that went into effect April 1, 2007. As quoted in the Forecasting Panel testimony, "For forecasting purposes, we assumed that the

real electric price remains at the 2006 level and does not include the April 2007 rate increase." Therefore, there is no basis to update the sales forecast to reflect the final revenue requirement.

Q. Are you saying that the sales forecast should not be updated?

A. No. We also believe that the sales, demand and resulting delivery revenue forecast should be updated, but for a different reason.

Q. Please explain.

A. The Company's sales and demand forecast assumes a forecasted level of savings related to the Company's proposed demand side management program in this proceeding. The final sales, demand and delivery revenue forecast approved in this proceeding should reflect the forecasted savings associated with the demand side management program approved in this proceeding. Accordingly, the Company's revenue requirement should be updated to reflect the final DSM program costs and final delivery revenue forecast based on the final approved demand side management program.

CITY TESTIMONY

Q. On sales volume forecasting, the City's witness Harvey Arnett considered the Company's adjustment to the sales forecast to remove the future impact of DSM as "a double count of the impact of DSM." How did he justify that?

A. Mr. Arnett argued that since the historical data contained DSM impacts of prior DSM programs, the forecasts from the sales models would include the DSM impacts already. He claimed that "because DSM has dampened sales over time, the effect of the sales models is to dampen the coefficients for the model's independent variables." To support this assertion, he conducted an analysis where he estimated a "simplified" version of the Company's sendout model using three different sendout data series. The first sendout series was the actual sendout and the other two series were artificially constructed using hypothetical assumptions. The second sendout series was based on an assumed "compound growth rate in DSM of 0.2 percent per year" (p. 17), while the third sendout series was based on "a variable impact of DSM, ... 0.1 percent through 1990 and 0.3 thereafter, ... compounded annually." (p. 18) Applying linear

regressions to these data sets, he produced the results in his Exhibit ___ (HA-2).

Q. Do you agree with Mr. Arnett's analysis?

A. No. Mr. Arnett's analysis is based on hypothetical data that do not reflect the actual DSM impact of prior DSM programs and uses a simplified regression model that misses an important part of the Company's sales forecasting models, the ARIMA terms. Both of the constructed sendout series that Mr. Arnett used assumed that the DSM impact was growing throughout the estimation period. In reality, the Company's sponsored DSM programs do not have a continuously growing impact. For example, the last major Company sponsored DSM program operated from 1989 through 1998. Whatever impact that program had on sales would have been picked up by the ARIMA terms in the Company's sales forecasting models. Given the significant gap between the end of that program and the beginning of the sales forecasting period, the impact of DSM in that period had long been fully accounted for in the sales data and no further effect can be extrapolated from the data. Therefore, any new DSM programs would

reduce sales. The DSM programs proposed by the Company are incremental to prior DSM programs.

Q. Does this conclude your rebuttal testimony?

A. Yes. It does.

Attachment to Staff Response to Con Edison IR-53

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============================================================
Dependent Variable: D(NC01,0,4)
Method: Least Squares
Date: 09/19/07   Time: 14:48
Sample: 1981Q1 2003Q4
Included observations: 92
Convergence achieved after 15 iterations
Backcast: 1979Q4 1980Q4
============================================================
     Variable      CoefficienStd. Errort-Statistic  Prob.
============================================================
         C          13.64884   0.344922   39.57078   0.0000
       AR(1)        0.889035   0.056997   15.59788   0.0000
       MA(1)        0.273511   0.107986   2.532842   0.0131
      SMA(4)       -0.936344   0.027904  -33.55548   0.0000
============================================================
R-squared           0.854335    Mean dependent var 13.35732
Adjusted R-squared  0.849369    S.D. dependent var 4.450590
S.E. of regression  1.727325    Akaike info criteri3.973530
Sum squared resid   262.5614    Schwarz criterion  4.083173
Log likelihood     -178.7824    F-statistic        172.0424
Durbin-Watson stat  1.914290    Prob(F-statistic)  0.000000
============================================================
Inverted AR Roots        .89
Inverted MA Roots        .98    -.00+.9  -.00-.98i     -.27
                        -.98
============================================================



         Forecast Evaluation
=====================================
Forecast: NC01FX
Actual: NC01
Forecast sample: 2004Q1 2006Q4
Included observations: 12
=====================================
Root Mean Squared Error       8.281405
Mean Absolute Error           7.735924
Mean Absolute Percentage Error0.287367
Theil Inequality Coefficient  0.001534
     Bias Proportion          0.872602
     Variance Proportion      0.032826
     Covariance Proportion    0.094571
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============================================================
Dependent Variable: NC01
Method: Least Squares
Date: 09/19/07   Time: 14:48
Sample (adjusted): 1981Q2 2003Q4
Included observations: 91 after adjustments
Convergence achieved after 9 iterations
Backcast: 1980Q2 1981Q1
============================================================
     Variable      CoefficienStd. Errort-Statistic  Prob.
============================================================
         C          2373.283   3.780944   627.6959   0.0000
```

TREND	3.418290	0.066647	51.28939	0.0000
AR(1)	0.800020	0.068817	11.62539	0.0000
MA(4)	0.473101	0.095188	4.970186	0.0000

R-squared	0.999379	Mean dependent var	2531.054
Adjusted R-squared	0.999357	S.D. dependent var	91.08723
S.E. of regression	2.309498	Akaike info criteri	4.554898
Sum squared resid	464.0390	Schwarz criterion	4.665266
Log likelihood	-203.2479	F-statistic	46637.05
Durbin-Watson stat	1.809130	Prob(F-statistic)	0.000000

Inverted AR Roots	.80			
Inverted MA Roots	.59+.59i	.59+.5	-.59-.59i	-.59-.59i

Forecast Evaluation

Forecast: NC01FSX
Actual: NC01
Forecast sample: 2004Q1 2006Q4
Included observations: 12

Root Mean Squared Error	8.706656
Mean Absolute Error	8.317727
Mean Absolute Percentage Error	0.308818
Theil Inequality Coefficient	0.001613
Bias Proportion	0.912655
Variance Proportion	0.008836
Covariance Proportion	0.078509

obs	NC01	NC01FX	NC01FSX
2004Q1	2680.322	2683.413	2683.498
2004Q2	2677.040	2686.894	2686.473
2004Q3	2677.993	2687.883	2689.068
2004Q4	2684.160	2694.342	2692.968
2005Q1	2687.117	2698.644	2697.397
2005Q2	2691.443	2701.949	2701.624
2005Q3	2694.135	2702.782	2705.689
2005Q4	2701.308	2709.103	2709.624
2006Q1	2705.060	2713.282	2713.456
2006Q2	2709.588	2716.477	2717.206
2006Q3	2713.207	2717.212	2720.889
2006Q4	2721.225	2723.447	2724.519