

# Demand Response: 2016 IRM Studies

**Vijaya Ganugula**

*Manager, Demand Response Operations  
New York Independent System Operator*

**NYSRC – Installed Capacity Subcommittee**

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*Krey Corporate Center*

# SCR Model Values

- ◆ **Each year the NYISO provides supporting data and a recommendation to the ICS regarding the SCR performance and the model values for the IRM basecase studies**
  
- ◆ **At the July 2015 meeting, ICS accepted:**
  - *SCR model value of 960.9 MW for the IRM basecase studies*
  - *Sensitivity analysis with NYISO's recommended SCR model value of 859.7 MW*
  
- ◆ **To complement the sensitivity analysis results, this presentation provides additional information on average SCR performance during one-hour tests and the mandatory events**

This was discussed at the following ICS meetings:

April 28, 2015

[http://www.nysrc.org/pdf/MeetingMaterial/ICSMaterial/ICS\\_Agenda171/Demand%20Response%20Preliminary%20Model%20Values%20for%202015%20IRM%20Studies\\_3.pdf](http://www.nysrc.org/pdf/MeetingMaterial/ICSMaterial/ICS_Agenda171/Demand%20Response%20Preliminary%20Model%20Values%20for%202015%20IRM%20Studies_3.pdf)

July 1, 2015

[http://www.nysrc.org/pdf/MeetingMaterial/ICSMaterial/ICS\\_Agenda173/Demand%20Response%20Final%20Model%20Values%20for%202016%20IRM%20Studies.pdf](http://www.nysrc.org/pdf/MeetingMaterial/ICSMaterial/ICS_Agenda173/Demand%20Response%20Final%20Model%20Values%20for%202016%20IRM%20Studies.pdf)

July 6, 2015 – material was not posted for this discussion

# SCR Model Values – Background

- ◆ **The NYISO’s recommendation of 859.7 MW was based on:**
  - *The ICS accepted methodology to determine SCR model values is based on prior year’s performance data*
  - *There were no mandatory SCR events in Winter 2013-2014 and Summer 2014*
  - *SCR performance factors for this timeframe were determined based on one-hour performance tests only*
  - *Historically, SCR performance during one-hour tests is higher than during mandatory SCR events*
  - *The ISO is concerned that using only the prior year’s data is causing variability in the SCR representation from year to year*

# Average SCR Zonal Performance during One-hour Tests

Capability Period	Zone										
	A	B	C	D	E	F	G	H	I	J	K
Summer 2012	93.8%	88.3%	97.0%	100.0%	87.7%	83.6%	75.1%	70.2%	87.9%	100.0%	100.0%
Winter 2012-2013	100.0%	94.9%	100.0%	100.0%	95.0%	100.0%	100.0%	100.0%	72.9%	100.0%	100.0%
Summer 2013	92.7%	89.5%	91.4%	43.1%	96.2%	87.6%	100.0%	100.0%	88.1%	100.0%	88.0%
Winter 2013-2014	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.5%	100.0%	100.0%	100.0%	100.0%
Summer 2014	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Average Test Performance</b>	<b>97.3%</b>	<b>94.5%</b>	<b>97.7%</b>	<b>88.6%</b>	<b>95.8%</b>	<b>94.2%</b>	<b>94.3%</b>	<b>94.0%</b>	<b>89.8%</b>	<b>100.0%</b>	<b>97.6%</b>
Average SCR performance during five most recent mandatory events	89.7%	79.5%	82.2%	56.4%	65.8%	87.8%	78.9%	96.0%	69.1%	66.0%	54.9%
Difference in average performance between one-hour SCR tests and mandatory events	7.6%	15.0%	15.5%	32.3%	30.0%	6.4%	15.4%	-1.9%	20.7%	34.0%	42.7%

Notes:

1. SCR enrollments in Zone H are less than 10 MW and small changes in performance magnify % differences
2. % performance reported is capped to 100%
3. Performance reported for each capability period includes performance in both Test 1 and Test 2, if data exists
4. Maximum performance demonstrated in Test 1 and Test 2 is considered for resources that are required to perform in both tests

**Since Summer 2012, average SCR zonal performance during one-hour SCR tests is 6%-43% higher\* compared to the average zonal performance during five most recent mandatory events**  
 \*see Note 1 on Zone H performance

# SCR Performance

- ◆ **Since Summer 2012, SCR performance in the one-hour tests has averaged between 88-100%**
  
- ◆ **During Summer 2014 and Winter 2013-2014, there were no mandatory events and performance was based solely on one-hour performance tests**
  
- ◆ **The NYISO observed a step increase in performance of SCRs believed to be tied to a transition from a dataset that included events and tests to a dataset including only one-hour performance tests**
  
- ◆ **In order to account for this, the NYISO recommended that ICS use a lower “Effective Capacity Value.” Using an Effective Capacity Value factor of 0.85 will result in an Effective Performance of 68.4% for the 2016 studies which closely aligns with the value used last year, which had a dataset that included actual event data**
  - *The Effective Performance accepted by ICS last year was 65.5%*

# Comparison with Last Year's SCR Model Values

	NYCA SCR Enrollment MW	NYCA Model Value MW	Effective Performance %	Number of Test Hours Considered	Number of Event Hours Considered
2015 IRM Studies	1132.4	742.1	65.5%	2 for all Zones	10 for Zones A-F 27 for Zones G-K
2016 IRM Studies ( <i>NYISO</i> )	1253.9	859.7	68.4%	2 for all zones	None
2016 IRM ( <i>Accepted by ICS</i> )	1253.9	960.9	76.6%	2 for all zones	None

**Notes:**

1. Model Value = SCR Enrolled MW \* ACL based Performance Factors \* Translation Factors (ACL to CBL) \* Effective Capacity Value \* Fatigue Factor
2. Effective Performance% = Model Value / SCR Enrollment MW
3. NYISO recommended to adjust Effective Capacity Value from 0.95 to 0.85 since there were no four-hour events in Summer 2014
4. ICS Accepted Effective Capacity Value of 0.95 for the 2016 IRM Basecase Studies

# Appendix

# Demand Response: Preliminary Model Values for 2016 IRM Studies

**Kathleen M. Berger**

*Senior Analyst, Demand Response Operations  
New York Independent System Operator*

**NYSRC – Installed Capacity Subcommittee**

*April 28, 2015*

*NYISO Krey Corporate Center*



# Topics

- ◆ **Background**
- ◆ **NYISO Recommended Preliminary SCR Model Values**
- ◆ **Appendix**

# Background

- ◆ **The NYISO calculates the SCR zonal performance factors based on historical performance using ICAP measures.**
- ◆ **ICS applies additional adjustment factors:**
  - *ICS adjusts adjustment factors up/down based on prior year's SCR event response (when data is available):*
    - *Translation Factor*
    - *Effective Capacity Value*
    - *Fatigue Factor*

**Effective Performance Factor = Zonal Performance Factor \*  
Translation Factor \* Effective Capacity Value \* Fatigue Factor**

**SCR Model Value MW = SCR ICAP MW \* Effective Performance  
Factor**

# SCR Adjustment Factors used in IRM Studies

- ◆ **Translation Factor (ACL to CBL)**
  - ◆ **The Translation Factor is used to adjust performance based on ICAP measures to a CBL equivalent.**
- ◆ **Effective Capacity Value**
  - ◆ **The Effective Capacity Value adjustment factor is used to account for performance changes beyond the minimum required 4-hour performance period during an event.**
- ◆ **Fatigue Factor**
  - ◆ **The Fatigue Factor adjustment factor is applied to address concerns that fatigue may occur if SCRs are deployed frequently.**

# Zonal Performance Factors and Adjustment Factors

- ◆ **Zonal Performance Factors were calculated based on Summer 2014 and Winter 2013-2014 test responses.**
- ◆ **There were no NYISO Demand Response Events called during Summer 2014. Performance was based on one-hour SCR performance test responses.**
- ◆ **The NYISO recommends using the same Translation Factor (ACL to CBL) and Fatigue Factor as used last year since no additional information is available to recommend a change:**
  - ◆ **Translation Factor (ACL to CBL):**
    - *NYISO recommends keeping the Translation Factor (for ACL to CBL) at 0.90*
  - ◆ **Fatigue Factor:**
    - *NYISO recommends keeping the Fatigue Factor at 1.00*

# Zonal Performance Factors and Adjustment Factors, continued

- ◆ **Since there were no four-hour events during Summer 2014 it makes it difficult to assess performance for purposes of reliability studies and therefore the NYISO recommends adjusting the Effective Capacity Value.**
  - *The Effective Capacity Value was used in the past to account for performance change beyond the minimum required four-hour performance period during an event.*
  - *The NYISO recommends broadening the definition of Effective Capacity Value to also account for years that did not have events, such as 2014.*
  
- ◆ **For 2015, the NYISO recommends using an Effective Capacity Value of 0.85**
  - *In 2014, the Effective Capacity Value was 0.95*

# Zonal Performance Factors and Adjustment Factors, continued

- ◆ **Using an Effective Capacity Value factor of 0.85 will result in an Effective Performance of 68.4% in 2015 which closely aligns with that used last year.**
  - *In 2014, the Effective Performance was 65.5%*

# SCR Model Values – NYISO Recommendation

## Changing Effective Capacity Value Factor to 0.85

Column	A	B	C	D	E	F	G	
Superzone	SCR Enrollment 2015 Gold Book Forecast *	ACL Based Performance Factors	Translation Factor (ACL to CBL)**	Effective Capacity Value***	Fatigue Factor**	Model Value MW (=Col A * Col B * Col C * Col D * Col E)	Effective Performance % (=Col B * Col C * Col D * Col E)	
1	A-F	618.4	0.9357	0.90	0.85	1.00	442.7	71.6%
2	G-I	67.3	0.8783	0.90	0.85	1.00	45.2	67.2%
3	J	369.4	0.8415	0.90	0.85	1.00	237.8	64.4%
4	K	69.3	0.8115	0.90	0.85	1.00	43.0	62.1%
5	<b>Total</b>	<b>1124.4</b>					<b>768.7</b>	<b>68.4%</b>

**\* Consistent with past practice, the 2015 Gold Book Forecast will be replaced with actual July 2015 enrollment when information is available after June 8, 2015.**

**\*\* The NYISO recommends keeping the same Translation Factor and Fatigue Factor used last year**

**\*\*\* The NYISO recommends adjusting the Effective Capacity Value to 0.85**

# Comparison of 2014 and 2015 Model Values using the NYISO Recommended 85% Effective Capacity Value Factor

Superzone	2014 ACL Based Performance Factors	2015 ACL Based Performance Factors	ACL Based Performance Factors Comparison	Effective Performance (%)		Effective Performance (%) Comparison	Model Value (MW)*		Model Value (MW) Comparison
	2014	2015	2014 to 2015	2014	2015	2014 to 2015	2014	2015	2014 to 2015
A-F	0.8486	0.9357	0.0871	72.6%	71.6%	-1.0%	450.2	442.7	-7.5
G-I	0.7388	0.8783	0.1395	63.2%	67.2%	4.0%	42.8	45.2	2.4
J	0.6492	0.8415	0.1923	55.5%	64.4%	8.9%	207.6	237.8	30.2
K	0.6717	0.8115	0.1398	57.4%	62.1%	4.7%	40.3	43.0	2.7
<b>Total</b>				<b>65.5%</b>	<b>68.4%</b>	<b>2.9%</b>	<b>740.9</b>	<b>768.7</b>	<b>27.8</b>

**\* Consistent with past practice, the 2015 Gold Book Forecast will be replaced with actual July 2015 enrollment when information is available after June 8, 2015.**



# Appendix for the April 28, 2015 Presentation

# Comparison of Effective Performance Factors based on Effective Capacity Values ranging from 95% to 80% (no change to Translation Factor @ 90% or Fatigue Factor @ 100%)

**NYISO RECOMMENDATION**

Column	A	B	D	F	G					
Superzone	SCR Enrollment 2015 Gold Book Forecast *	ACL Based Performance Factors	Effective Capacity Value @ 0.85	Model Value MW (=Col A * Col B * Col C * Col D * Col E)	Effective Performance % (=Col B * Col C * Col D * Col E)	Effective Performance % 2014	Effective Performance % Comparison	Model Value MW 2014	Model Value (MW) Comparison	
Row							2014 to 2015		2014 to 2015	
1	A-F	618.4	0.9357	0.85	442.7	71.6%	72.6%	-1.0%	450.2	-7.5
2	G-I	67.3	0.8783	0.85	45.2	67.2%	63.2%	4.0%	42.8	2.4
3	J	369.4	0.8415	0.85	237.8	64.4%	55.5%	8.9%	207.6	30.2
4	K	69.3	0.8115	0.85	43.0	62.1%	57.4%	4.7%	40.3	2.7
5	<b>Total</b>	<b>1124.4</b>			<b>768.7</b>	<b>68.4%</b>	<b>65.5%</b>	<b>2.9%</b>	<b>740.9</b>	<b>27.8</b>

Column	A	B	D	F	G					
Superzone	SCR Enrollment 2015 Gold Book Forecast *	ACL Based Performance Factors	Effective Capacity Value @ 0.95	Model Value MW (=Col A * Col B * Col C * Col D * Col E)	Effective Performance % (=Col B * Col C * Col D * Col E)	Effective Performance % 2014	Effective Performance % Comparison	Model Value MW 2014	Model Value (MW) Comparison	
Row							2014 to 2015		2014 to 2015	
1	A-F	618.4	0.9357	0.95	494.7	80.0%	72.6%	7.4%	450.2	44.5
2	G-I	67.3	0.8783	0.95	50.5	75.1%	63.2%	11.9%	42.8	7.7
3	J	369.4	0.8415	0.95	265.8	71.9%	55.5%	16.4%	207.6	58.2
4	K	69.3	0.8115	0.95	48.1	69.4%	57.4%	12.0%	40.3	7.8
5	<b>Total</b>	<b>1124.4</b>			<b>859.1</b>	<b>76.4%</b>	<b>65.5%</b>	<b>10.8%</b>	<b>740.9</b>	<b>118.2</b>

Column	A	B	D	F	G					
Superzone	SCR Enrollment 2015 Gold Book Forecast *	ACL Based Performance Factors	Effective Capacity Value @ 0.90	Model Value MW (=Col A * Col B * Col C * Col D * Col E)	Effective Performance % (=Col B * Col C * Col D * Col E)	Effective Performance % 2014	Effective Performance % Comparison	Model Value MW 2014	Model Value (MW) Comparison	
Row							2014 to 2015		2014 to 2015	
1	A-F	618.4	0.9357	0.90	468.7	75.8%	72.6%	3.2%	450.2	18.5
2	G-I	67.3	0.8783	0.90	47.9	71.1%	63.2%	7.9%	42.8	5.1
3	J	369.4	0.8415	0.90	251.8	68.2%	55.5%	12.7%	207.6	44.2
4	K	69.3	0.8115	0.90	45.6	65.7%	57.4%	8.3%	40.3	5.3
5	<b>Total</b>	<b>1124.4</b>			<b>813.9</b>	<b>72.4%</b>	<b>65.5%</b>	<b>6.9%</b>	<b>740.9</b>	<b>73.0</b>

Column	A	B	D	F	G					
Superzone	SCR Enrollment 2015 Gold Book Forecast *	ACL Based Performance Factors	Effective Capacity Value @ 0.80	Model Value MW (=Col A * Col B * Col C * Col D * Col E)	Effective Performance % (=Col B * Col C * Col D * Col E)	Effective Performance % 2014	Effective Performance % Comparison	Model Value MW 2014	Model Value (MW) Comparison	
Row							2014 to 2015		2014 to 2015	
1	A-F	618.4	0.9357	0.80	416.6	67.4%	72.6%	-5.2%	450.2	-33.6
2	G-I	67.3	0.8783	0.80	42.5	63.2%	63.2%	0.0%	42.8	-0.3
3	J	369.4	0.8415	0.80	223.8	60.6%	55.5%	5.1%	207.6	16.2
4	K	69.3	0.8115	0.80	40.5	58.4%	57.4%	1.0%	40.3	0.2
5	<b>Total</b>	<b>1124.4</b>			<b>723.5</b>	<b>64.3%</b>	<b>65.5%</b>	<b>-1.2%</b>	<b>740.9</b>	<b>-17.4</b>

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# Demand Response: Final Model Values for 2016 IRM Studies

**Kathleen M. Berger**

*Senior Analyst, Demand Response Operations  
New York Independent System Operator*

**NYSRC – Installed Capacity Subcommittee**

*July 1, 2015*

*NYISO Krey Corporate Center*

# Background

- ◆ **At the 4/28/2015 meeting, the ICS approved NYISO recommended values for the SCR zonal performance factors and derate factors**
  - *2015 Gold Book Forecast values for the SCR enrollments were used to calculate the preliminary model values for the 2016 IRM studies before the actual July 2015 enrollment information was available*
- ◆ **July 2015 SCR enrollment information is now available**
- ◆ **Consistent with past practice, this presentation shows the final SCR model values calculated based on the actual July 2015 enrollments**

# SCR Model Values – Final Values with Actual July 2015 Enrollments

Column	A	B	C	D	E	F	G	
Superzone	July 2015 Enrollments*	ACL Based Performance Factors	Translation Factor (ACL to CBL)**	Effective Capacity Value***	Fatigue Factor**	Model Value MW (=Col A * Col B * Col C * Col D * Col E)	Effective Performance % (=Col B * Col C * Col D * Col E)	
1	A-F	719.1	0.9357	0.90	0.85	1.00	514.8	71.6%
2	G-I	80.6	0.8783	0.90	0.85	1.00	54.1	67.2%
3	J	386.1	0.8415	0.90	0.85	1.00	248.6	64.4%
4	K	68.1	0.8115	0.90	0.85	1.00	42.3	62.1%
5	<b>Total</b>	<b>1253.9</b>					<b>859.7</b>	<b>68.4%</b>

**\*Consistent with past practice, the 2015 Gold Book Forecast values are now replaced with actual July 2015 SCR enrollment numbers.**

**\*\* The NYISO recommends keeping the same Translation Factor and Fatigue Factor used last year**

**\*\*\* The NYISO recommends adjusting the Effective Capacity Value to 0.85**

# Appendix for the July 1, 2015 Presentation

# SCR Model Values – Based on 2015 Gold Book Forecast (as presented at 4/28/2015 ICS Meeting)

Column	A	B	C	D	E	F	G	
Superzone	SCR Enrollment 2015 Gold Book Forecast *	ACL Based Performance Factors	Translation Factor (ACL to CBL)**	Effective Capacity Value***	Fatigue Factor**	Model Value MW (=Col A * Col B * Col C * Col D * Col E)	Effective Performance % (=Col B * Col C * Col D * Col E)	
1	A-F	618.4	0.9357	0.90	0.85	1.00	442.7	71.6%
2	G-I	67.3	0.8783	0.90	0.85	1.00	45.2	67.2%
3	J	369.4	0.8415	0.90	0.85	1.00	237.8	64.4%
4	K	69.3	0.8115	0.90	0.85	1.00	43.0	62.1%
5	<b>Total</b>	<b>1124.4</b>					<b>768.7</b>	<b>68.4%</b>

**\*Consistent with past practice, the 2015 Gold Book Forecast values are now replaced with actual July 2015 SCR enrollment numbers.**

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## SCR Adjustment Factors used in IRM Studies

- ◆ **Translation Factor (ACL to CBL)**
  - ◆ *The Translation Factor is used to adjust performance based on ICAP measures to a CBL equivalent.*
- ◆ **Effective Capacity Value**
  - ◆ *The Effective Capacity Value adjustment factor is used to account for performance changes beyond the minimum required 4-hour performance period during an event.*
- ◆ **Fatigue Factor**
  - ◆ *The Fatigue Factor adjustment factor is applied to address concerns that fatigue may occur if SCRs are deployed frequently.*

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