

**R103-11**

***TDI's NYC Merchant CHPE  
Transmission Project with POI at  
Astoria (NYISO Queue #305)  
Deliverability Analysis***

Prepared for

**Transmission Developers, Inc.**

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Siemens PTI Project Number P/21-113610-B-1

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## Legal Notice

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# Executive Summary

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## A. Introduction

Siemens Energy, Inc., Siemens Power Technologies International (Siemens PTI) has conducted a preliminary evaluation of the power deliverability of the proposed interconnection of the Transmission Developer Inc. (TDI)'s HVDC Merchant Champlain Hudson Power Express (CHPE) Transmission Project, NY Queue #305 (the "Project"). The Project is expected to inject 1,000 MW into Astoria 345 kV substation which is owned by the New York Power Authority.

The purpose of the deliverability study was to evaluate the capacity and energy deliverability capability at the Astoria 345 kV Substation for the existing system and with the addition of a new 345 kV cable between Astoria and Rainey.

The deliverability study case for thermal analysis primarily utilized base case and PSS<sup>®</sup>MUST data which the NYISO utilized to perform the deliverability study for the Class Year 2010 Facilities Studies. Additional thermal analysis was performed utilizing the base case in the Optional Interconnection Study for the TDI's Merchant Transmission Project with POI at Astoria (NYISO Queue #305).

## B. Scope of Work

The thermal analysis was performed according to the following scope:

1. Capacity Deliverability Analysis
  - a. Confirm the database and study techniques utilized in this study is consistent with the deliverability study performed for the NYISO Class Year 2010 Facilities Studies.
  - b. Determine the existing system capacity delivery limit from the Astoria 345 kV substation.
  - c. Determine the capacity delivery limit with a new 345 kV cable between Astoria and Rainey.
  - d. Perform other capacity delivery analysis to determine whether the point of interconnection would affect the capacity delivery limit.
2. Energy Deliverability Analysis
  - a. Determine the existing system energy delivery limit from the Astoria 345 kV substation.
  - b. Determine the effect of implementing a Special Protection System (SPS) or STE Exception at the Astoria 345 kV substation.

- c. Determine the energy delivery limit from the Astoria 345 kV substation with a new 345 kV cable between Astoria and Rainey.
- d. Determine the energy delivery limit from the Astoria 345 kV substation with a new 345 kV cable between Astoria and Rainey plus a SPS or a STE exception.

## C. Results of the Deliverability Study

The following results are based upon the Siemens PTI system studies:

### 1. Capacity Deliverability Analysis

- a. Table 2-1. Base Case Capacity Deliverability Capability confirms the database and study techniques utilized in this study is consistent with the deliverability study performed for the NYISO Class Year 2010 Facilities Studies.
- b. Table 2-1. Base Case Capacity Deliverability Capability also identifies the existing system capacity delivery limit from the Astoria 345 kV substation is 1,076 MW based upon the 538 MW pre-disturbance power flow on each of the E13th Street-Astoria 345 kV cables.
- c. Table 2-2. Capacity Deliverability Capability With Astoria-Rainey 345 kV Cable identifies the Astoria 345 kV substation capacity delivery limit is increased from 1,076 MW to 1,164 MW with a new 345 kV cable between Astoria and Rainey, based upon the Normal limit of the Rainey 345/138 kV 8W transformer.
- d. Table 2-3. Capacity Deliverability Capability at W49th Street illustrates that the FCITC capacity delivery limit of project would be essentially the same as if the point of interconnection was at Astoria 345 kV substation. The limit is more dependent upon the participation of generators used to reduce generation within the New York City area than the point of generation injection on the New York 345 kV network.

### 2. Energy Deliverability Analysis

- a. Table 2-5. Existing System Energy Deliverability Capability from Astoria 345 kV substation is 621 MW based upon the 621 MW post-contingency power flow of one of the E13th Street-Astoria 345 kV cable for the loss of the other E13th Street-Astoria 345 kV cable.
- b. Table 2-5. Existing System Energy Deliverability Capability also illustrates the energy deliverability could be increased to its nominal capability of 1,076 MW if a SPS was available to automatically runback HVDC power flow with the loss of one of the E13th Street-Astoria 345 kV cables. This limit would also be valid if an exception was granted to utilize the post-contingency STE ratings of the E13th Street-Astoria 345 kV cables with a manual runback of the CHPE project.

- c. Table 2-6. Energy Deliverability Capability With Astoria-Rainey 345 kV Cable also illustrates that the energy delivery limit from the Astoria 345 kV substation with a new 345 kV cable between Astoria and Rainey plus a SPS or a STE exception would be 1,578 MW.

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## Introduction

Siemens PTI has performed an analysis to investigate the deliverability capability of capacity and energy export from the Astoria 345 kV station. The analysis was performed using PSS<sup>®</sup>MUST software. The power flow base case and PSS<sup>®</sup>MUST data were provided by the NYISO. These are the same data that were utilized in the Class Year 2010 Facilities Study Part 2: Deliverability Study and System Deliverability Upgrade Facilities (SDU).

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Section  
**2**

# Deliverability Analysis

## 2.1 Capacity Deliverability Capability

### 2.1.1 Initial Base Case

Initially the capacity deliverability capability analysis was performed on the base case. The results of the PSS<sup>®</sup>MUST analysis are included in Appendix A.1 and summarized in Table 2-1. These results for the CHPE project confirm the results indicated in the “Table 7 – Capacity Deliverability within the NYC Capacity Region for the ATRA FCITC limit” of the NYISO report “Class Year 2010 Facilities Studies, Part 2 Studies (Sections 11, 12, 13 only): Deliverability Study and System Deliverability Upgrade Facilities (SDU), Final Report, July 14, 2011” with respect to the Berrians III project.

The base case used in this analysis has Poletti generation dispatched at 829 MW and the Berrians III project at 158 MW. Thus, total generation dispatched at Astoria 345 kV station was 987 MW.

**Table 2-1. Base Case Capacity Deliverability Capability**

FCITC	TDI Q305	Astoria 345	LE From	TDF	Pre Shift	Rating	Contingency
88.5	247	1076.5	E13ST 47-ASTORIA 345	-0.51	-493.1	538.0	Base Case
91.6	250.1	1077.6	E13ST 48-ASTORIA 345	-0.49	-492.9	538.0	Base Case
177.2	335.7	1163.2	RAINEY8W-345/138KV	-0.24	-213.8	256.0	Base Case
178.9	337.5	1164.9	RAINEY8W-VERNON 138	0.24	213.4	256.0	Base Case

The small difference between the NYISO results and the results shown in Table 2-3 is due to the fact that the analysis presented in this report only considered the CHPE project. The NYISO analysis evaluated the Berrians III and South Pier Improvement.

The total capacity deliverability capability is indicated in the “Astoria 345” column.

### 2.1.2 CHPE Q305 Connected to Astoria 345 kV Station With The Astoria-Rainey 345 kV Cable

Analysis was performed to determine the impact of adding to the transmission system a 345 kV cable connecting the Astoria and Rainey substations with the CHPE Q305 project connected to the Astoria 345 kV Station. For this analysis, the Astoria-Rainey cable characteristics were assumed to be similar to the Rainey-Mott Haven 345 kV cable. The results of the PSS®MUST analysis is included in Appendix A.2 and summarized in Table 2-2.

**Table 2-2. Capacity Deliverability Capability With Astoria-Rainey 345 kV Cable**

FCITC	TDI Q305	Astoria 345	LE From	TDF	Pre Shift	Rating	Contingency
177.9	336.5	1164	RAINEY8W-345/138KV	-0.24	-213.6	256.0	Base Case
201.1	359.7	1166	RAINEY8W-VERNON 138	0.24	213.2	256.0	Base Case
350.5	509.1	1337	ASTORIA-RAINEY 345	-0.88	-543.3	851.0	E13ST 47-ASTORIA 345

### 2.1.3 CHPE Q305 Connected to W49th Street

Analysis was performed to determine the impact of moving the CHPE Q305 project to W49th Street Station. The results of the PSS®MUST analysis are included in Appendix A.3 and summarized in Table 2-3.

**Table 2-3. Capacity Deliverability Capability at W49th Street**

FCITC	TDI Q305	Astoria 345	LE From	TDF	Pre Shift	Rating	Contingency
199.2	357.7	805.4	RAINEY8W-345/138KV	-0.21	-213.8	256.0	Base Case
201.1	359.8	805.2	RAINEY8W-VERNON 138	0.21	213.4	256.0	Base Case

These results indicate that FCITC capacity deliverability capability limit, based upon the Rainey 8W 345 kV transformer, is the basically the same. There is only a small difference of 22 MW due to the location of the project. In both cases the TDF (Transfer Distribution Factor) is greater than 0.20 due to the selection of generators in NYC and their P<sub>MAX</sub> and P<sub>MIN</sub> values used in simulation of the transfer limit analysis. Based on the data utilized, the FCITC capacity deliverability limit would essentially be the same if the project were located at other stations in the New York City 345 kV system.

## 2.2 Energy Deliverability Capability

The NYISO Deliverability test methodology used to determine the Capacity Resource Interconnection Service (CRIS) requires that generation in the rest of the region must be scaled uniformly. However, when energy deliverability is considered, it is conceivable that

the transmission constraint may be relieved by using a security constrained economic dispatch.

Using distribution factor analysis, the generators identified in Table 2-4 were found to have significant impact on the loading of the Rainey 345/138 kV transformer.

**Table 2-4. Generation Distribution Factors on Rainey 345/138 kV Transformer**

Generator	DFAX
RNYGT4-7	0.55
KEYSPG-1	0.26
RAV 2	0.21
RAV 1	0.21
AST 5	0.16
POLETGT2	0.16
POLETGT1	0.16
POLETTI	0.16
AWGT1	0.16
AWGT2	0.16
AST 3	0.16
POLETSTG	0.16

Energy delivery analysis was performed on a modified base case in which generation was increased 132 MW at Ravenswood 2 and 132 MW was reduced at Ravenswood 3. The PSS®MUST data was also modified to exclude changes to the generators listed in Table 2-4 when generation was shifted from Astoria 345 kV station to the rest of NYC.

### 2.2.1 Existing System

Initially the energy deliverability capability analysis for the existing system was performed on the modified base case. The results of the PSS®MUST analysis are included in Appendix A.4 and summarized in Table 2-5. These results indicated that energy delivery out of Astoria would be 621 MW based upon one of the E13th Street-Astoria 345 kV cables 621 MW LTE rating for the loss of the other E13th Street-Astoria 345 kV cable. With a SPS which would runback the post contingency power flow on the remaining E13th Street-Astoria 345 kV cables to its LTE rating or with an STE exception, the CHPE Q305 energy delivery capability would be 1,074 MW based upon the base case power flow on the E13th Street-Astoria 345 kV cables.

**Table 2-5. Existing System Energy Deliverability Capability**

FCITC	TDI Q305	Astoria 345	LE From	TDF	Pre Shift	Rating	Contingency
- 364.1	212	621	E13ST 47-ASTORIA 345	-1.00	985.1	621.0	E13ST 48- ASTORIA 345
- 364.1	212	621	E13ST 48-ASTORIA 345	-1.00	985.1	621.0	E13ST 47- ASTORIA 345
89.2	667.9	1074.4	E13ST 47-ASTORIA 345	-0.51	-492.7	538.0	Base Case
89.8	668.4	1074.9	E13ST 47-ASTORIA 345	-1.00	-531.2	621.0	Astoria 345 SPS: 455MW TDI Q305 Runback

### 2.2.2 Energy Delivery with Astoria-Rainey 345 kV Cable

Energy deliverability capability analysis was performed on the modified base case with a new Astoria-Rainey 345 kV Cable. The results of the PSS®MUST analysis are included in Appendix A.5 and summarized in Table 2-6.

Table 2-6 illustrates that the Astoria 345 kV station energy delivery capability would be limited to 1,237 MW based upon the 621 MW LTE rating for the E13st 47-Astoria 345 kV cable for the loss of the Astoria-Rainey 345 kV cable and also be limited to 1,348 MW for loss of an Astoria-E13th St 345 kV cable. TDI is proposing a Special Protection Scheme (SPS) which would automatically runback the output of the CHPE project to reduce the power flow on any of the lines exiting the Astoria substation to below their LTE rating upon a contingency which causes any of the lines to exceed their LTE rating. This will result in an energy delivery capability of 1,578 MW out of the Astoria substation. This limit will also be valid if an exception is granted to utilize the post-contingency STE ratings of the circuits exiting the Astoria substation with a manual runback of the CHPE project.

**Table 2-6. Energy Deliverability Capability With Astoria-Rainey 345 kV Cable**

FCITC	TDI Q305	Astoria 345	LE From	TDF	Pre Shift	Rating	Contingency
251.5	708.7	1237	E13ST 47-ASTORIA 345	-0.51	-493.2	621.0	ASTORIA-RAINEY 345
260.9	718.1	1246.8	E13ST 48-ASTORIA 345	-0.49	-492.7	621.0	ASTORIA-RAINEY 345
362.0	819.2	1347.9	ASTORIA-RAINEY 345	-0.85	-542.6	851.0	E13ST 47-ASTORIA 345
365.5	822.7	1351.4	ASTORIA-RAINEY 345	-0.85	-538.9	851.0	E13ST 48-ASTORIA 345
367.2	824.4	1353.1	ASTORIA-RAINEY 345	-0.85	-538.9	851.0	SB FARRAGUT 952
582.6	1039.8	1568.5	E13ST 47-ASTORIA 345	-0.51	-324.9	621.0	Astoria 345 SPS: Astoria-Rainey 345 335MW Runback
591.9	1049.1	1577.8	RAINEY8W-345/138KV	-0.18	-148.8	256.0	Base Case
593.0	1050.2	1,578.9	RAINEY8W-VERNON 138	0.18	148.6	256.0	Base Case

### 2.2.3 Generation Dispatch Changes for Astoria 345 kV 1,578 MW Export

The principal difference between capacity and energy deliverability analysis performed in this study is selection and amounts of generation reduced in the New York City area as generation was increased at the Astoria 345 kV station. The base case generation at Astoria 345 kV station was 987 MW. In order to simulate a 1,578 MW export from the Astoria 345 kV station, the generation at Astoria 345 kV station was increased by 591 MW and the generation in the rest of the New York City was decreased by the same amount.

For the capacity deliverability analysis for the New York City Area, NYISO procedures stipulate that all generators in the rest of the New York City must be scaled proportionally. This dispatch would cause overloads on the Rainey 345/138 kV 8W transformer when the Astoria 345 kV is increased by 177 MW (1,164 MW total).

For the energy delivery, NYISO procedures would implement a generation dispatch which would dispatch the generation within their economic security constraint procedures so that the Rainey 345/138 kV 8W transformer would not result in a security violation. Appendix B illustrates the generation differences which could be utilized to export 1,578 MW from Astoria 345 kV station without causing an overload on the Rainey 345/138 kV 8W transformer. The actual security constrained dispatch would depend upon the system load and economics of available generators.

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# PSS<sup>®</sup> MUST Analysis Results

## A.1 Base Case Capacity Deliverability Capability

### FCITC Single Study

PSS(R)MUST 10.2 -- Managing and Utilizing System Transmission -- SUN, OCT 23 2011 16:36 <FCT111.0>  
 2010 NYISO CLASS YEAR ATRA-D REV 3  
 2015 SUMMER PEAK LOAD W/ 2009 ERAG/MMWG & PJM RTEP 09 UPDATE  
 Case.File C:\TDIQ305\CY2010\_ATRA\_Deliverability\_rev8\_UDRproxxygen\_TDI1.sav  
 Subsys.File C:\TDIQ305\Auxiliary files\CY2009\_CY2010\_sub  
 Monit.File C:\TDIQ305\Auxiliary files\CY2009\_CY2010\_mon  
 Contin.File C:\TDIQ305\Auxiliary files\CY2010\_ATRA\_con  
 Exclud.File C:\TDIQ305\Auxiliary files\cy2009-2010Contingencies.exc

Interface-1 Interface 64 TDIQ3 Init.Flow= 158.53 TDF= 1.0000  
 Interface-2 Interface 65 AST345 Init.Flow= 988.05 TDF= 1.0000

From	To	Transfer Level	FCITC	EXPORT	Interfac e-1	Interfac e-2	Flag	LE From	LE To	Ckt	TDF	PreShift	Rating	Contingency
TDIQ305	J EXP TDI	3000.0	-167.3	-8.7	-8.8	820.8		Interface 24 Ontario-Mich			-0.07766	-13.0	0.0	147829 ASTOR345 345 148988 TDIQ305 345
			-165.7	-7	-7.1	822.4		Interface 24 Ontario-Mich			-0.07766	-12.9	0.0	Open 147829 ASTOR345 345 148988 TDIQ305 SB:AST 345 5 TDIQ305 & Q35M-48
														Open 126275 E13ST 48 345 126277 FARRAGUT Open 126275 E13ST 48 345 147829 ASTOR345 Open 126275 E13ST 48 345 126499 T11MPT Open 126275 E13ST 48 345 126867 E13 TX10 T Open 147829 ASTOR345 345 148988 TDIQ305
			-165.3	-6.7	-6.8	822.7	*	Interface 24 Ontario-Mich			-0.07766	-12.8	0.0	SB:AST 345 3 TDIQ305 & Q35L-B47 Open 126274 E13ST 47 345 126277 FARRAGUT Open 126274 E13ST 47 345 147829 ASTOR345 Open 126274 E13ST 47 345 126869 E13 TX16 T Open 126274 E13ST 47 345 126870 E13 TX17 T Open 147829 ASTOR345 345 148988 TDIQ305
			-157.9	0.7	0.6	830.1		Interface 20 ABC-JK PAR-I			0.55560	87.7	0.0	147829 ASTOR345 345 148988 TDIQ305 345 Open 147829 ASTOR345 345 148988 TDIQ305
			-156.3	2.3	2.2	831.8		Interface 20 ABC-JK PAR-I			0.55559	86.8	0.0	SB:AST 345 5 TDIQ305 & Q35M-48 Open 126275 E13ST 48 345 126277 FARRAGUT Open 126275 E13ST 48 345 147829 ASTOR345 Open 126275 E13ST 48 345 126499 T11MPT Open 126275 E13ST 48 345 126867 E13 TX10 T Open 147829 ASTOR345 345 148988 TDIQ305
			-156.2	2.4	2.4	831.9	*	Interface 20 ABC-JK PAR-I			0.55557	86.8	0.0	SB:AST 345 3 TDIQ305 & Q35L-B47 Open 126274 E13ST 47 345 126277 FARRAGUT Open 126274 E13ST 47 345 147829 ASTOR345 Open 126274 E13ST 47 345 126869 E13 TX16 T Open 126274 E13ST 47 345 126870 E13 TX17 T Open 147829 ASTOR345 345 148988 TDIQ305
			88.5	247.1	247	1076.5		126274 E13ST 47 345	147829 ASTOR345 3	1	-0.50705	-493.1	538.0	Base Case
			91.6	250.2	250.1	1079.6		126275 E13ST 48 345	147829 ASTOR345 3	1	-0.49295	-492.9	538.0	Base Case
			177.2	335.8	335.7	1165.3		126481 RAINEY8W 138	126562 8W DUM 1	1	-0.23835	-213.8	256.0	Base Case
			178.9	337.5	337.5	1167		126481 RAINEY8W 138	126507 VERNON-W 1	1	0.23835	213.4	256.0	Base Case
			370.5	529.1	529	1358.5		126295 RAINEY 345	126562 8W DUM 1	8	0.24516	165.2	256.0	Base Case
			383.1	541.7	541.6	1371.2		126480 RAINEY8E 138	126506 VERNON-E 1	1	0.24484	157.2	251.0	Base Case
			383.9	542.5	542.4	1371.9		126480 RAINEY8E 138	126561 8E DUM 1	1	-0.24484	-158.0	252.0	Base Case
			391.7	550.3	550.2	1379.8		126481 RAINEY8W 138	126562 8W DUM 1	1	-0.23835	-278.6	372.0	SB:Greenwood138 4N Open 126287 GOWNUSS 345 126429 GOWNUS2T Open 126428 GOWNUS2R 138 126429 GOWNUS2T Open 126428 GOWNUS2R 138 126434 GREENWOOD Remove unit 1 from bus 126257 GOWGT1A 13.8 Remove unit 1 from bus 126259 GOWGT1B 13.8 Remove unit 1 from bus 126258 GOWGT3A 13.8 Remove unit 1 from bus 126289 GOWGT3B 13.8 Remove unit 1 from bus 128666 Q261SO PIER 13.8 Remove unit 1 from bus 126308 NARRGT2A 13.8 Remove unit 1 from bus 126309 NARRGT2B 13.8
			393.4	552	552	1381.5		126481 RAINEY8W 138	126507 VERNON-W 1	1	0.23835	278.2	372.0	SB:Greenwood138 4N Open 126287 GOWNUSS 345 126429 GOWNUS2T



## **A.2 Capacity Deliverability Capability With Astoria-Rainey 345 kV Cable**

**FCITC Single Study**

PSS(R)MUST 10.2 -- Managing and Utilizing System Transmission -- SUN, OCT 23 2011 17:59 <FCIT11.0>  
 2010 NYISO CLASS YRRA ATRA-D REV 3  
 2015 SUMMER PEAK LOAD W/ 2009 ERAG/99% & PJM RFP 09 UPDATE  
 Case File C:\TDI\Q305\CY2010\_ATRA\_Deliverability\_rev6\_UDProxygen\_TDI3\_ASTRAINEY.sav  
 Subsys File C:\TDI\Q305\Auxiliary files\CY2009\_CY2010\_sub  
 Monit File C:\TDI\Q305\Auxiliary files\CY2009\_CY2010\_mon  
 Contin File C:\TDI\Q305\Auxiliary files\CY2010\_ATRA\_Con  
 Exclud File C:\TDI\Q305\Auxiliary files\cy2009-2010contingencies.exc

Interface-1 Interface 64 TDIQ3 Init.Flow= 150.53 TDF= 1.0000  
 Interface-2 Interface 65 AST345 Init.Flow= 986.00 TDF= 1.0000

Prom	To	Transfer Level	FCITC	EXPORT	Inter face-1	Inter face-2	Flow	LE Prom	LE To	Ckt	TDP	PreShift	Rating	Contingency
TDIQ305	J EXP TDI	3000.0	-167.2	-8.5	-8.6	818.8		Interface 24 Ontario-Mich			-0.07791	-13.0	0.0	147829 ASTOR345 345 148988 TDIQ305 345 1 204
			-165.1	-6.5	-6.6	820.9		Interface 24 Ontario-Mich			-0.07793	-12.9	0.0	Open 147829 ASTOR345 345 148988 TDIQ305 345 1 966
														SB:AST 345 5 TDIQ305 & Q35M-48
														Open 126275 E138T 48 345 126277 FARRAGUT 345 1
														Open 126275 E138T 48 345 147829 ASTOR345 345 1
														Open 126275 E138T 48 345 126499 T11MPT 138 11
														Open 126275 E138T 48 345 126867 E13 TX10 T 138 10
			-164.8	-6.2	-6.3	821.2	*	Interface 24 Ontario-Mich			-0.07793	-12.8	0.0	Open 147829 ASTOR345 345 148988 TDIQ305 345 1 965
														SB:AST 345 3 TDIQ305 & Q35L-847
														Open 126274 E138T 47 345 126277 FARRAGUT 345 1
														Open 126274 E138T 47 345 147829 ASTOR345 345 1
														Open 126274 E138T 47 345 126869 E13 TX16 T 138 16
														Open 126274 E138T 47 345 126870 E13 TX17 T 69.0 17
														Open 147829 ASTOR345 345 148988 TDIQ305 345 1 966
			-158.3	0.3	0.2	827.7		Interface 20 ABC-JX PAR-I			0.5532	87.6	0.0	SB:AST 345 5 TDIQ305 & Q35M-48
														Open 126275 E138T 48 345 126277 FARRAGUT 345 1
														Open 126275 E138T 48 345 147829 ASTOR345 345 1
														Open 126275 E138T 48 345 126499 T11MPT 138 11
														Open 126275 E138T 48 345 126867 E13 TX10 T 138 10
														Open 147829 ASTOR345 345 148988 TDIQ305 345 1 965
			-158.1	0.5	0.4	827.9		Interface 20 ABC-JX PAR-I			0.5531	87.5	0.0	SB:AST 345 3 TDIQ305 & Q35L-847
														Open 126274 E138T 47 345 126277 FARRAGUT 345 1
														Open 126274 E138T 47 345 147829 ASTOR345 345 1
														Open 126274 E138T 47 345 126869 E13 TX16 T 138 16
														Open 126274 E138T 47 345 126870 E13 TX17 T 69.0 17
														Open 147829 ASTOR345 345 148988 TDIQ305 345 1 966
			-158.1	0.5	0.4	827.9	*	Interface 20 ABC-JX PAR-I			0.55347	87.5	0.0	147829 ASTOR345 345 148988 TDIQ305 345 1 204
														Open 147829 ASTOR345 345 148988 TDIQ305 345 1
			177.9	336.5	336.4	1164		126481 RAINEY#W 138 126562 #W DDM 138 1			-0.23835	-213.6	256.0	Base Case
			179.6	338.2	338.1	1166		126481 RAINEY#W 138 126507 VERNON-W 138 1			0.23835	213.2	256.0	Base Case
			350.5	509.1	509	1337		126295 RAINEY 345 147829 ASTOR345 345 1			-0.87790	-543.3	851.0	126274 E138T 47 345 147829 ASTOR345 345 1 40
														Open 126274 E138T 47 345 147829 ASTOR345 345 1
			352.0	511.7	511.6	1339		126295 RAINEY 345 147829 ASTOR345 345 1			-0.87119	-543.4	851.0	126275 E138T 48 345 147829 ASTOR345 345 1 42
														Open 126275 E138T 48 345 147829 ASTOR345 345 1
			355.8	514.4	514.3	1342	*	126295 RAINEY 345 147829 ASTOR345 345 1			-0.87649	-539.1	851.0	SB:FARR 345 7# 962
														Open 126277 FARRAGUT 345 126590 GOMANUS 418# 345 1
														Open 126286 GOMANUS 345 126590 GOMANUS 415# 345 BY
														Open 126286 GOMANUS 345 126427 GOMANUS1T 138 1
														Open 126286 GOMANUS 345 128251 GOMANUS 345 1
														Open 126283 GOTHLS N 345 126286 GOMANUS 345 1
														Open 126274 E138T 47 345 126277 FARRAGUT 345 1
														Open 126274 E138T 47 345 147829 ASTOR345 345 1
														Open 126274 E138T 47 345 126869 E13 TX16 T 138 16
														Open 126274 E138T 47 345 126870 E13 TX17 T 69.0 17
			371.2	529.8	529.7	1357		126295 RAINEY 345 126562 #W DDM 138 8			0.24516	165.0	256.0	Base Case
			383.5	542.1	542	1370		126480 RAINEY#E 138 126506 VERNON-E 138 1			0.24484	157.1	251.0	Base Case
			384.3	542.9	542.8	1370		126480 RAINEY#E 138 126561 #E DDM 138 1			-0.24484	-157.9	252.0	Base Case
			391.7	550.3	550.2	1378		126481 RAINEY#W 138 126562 #W DDM 138 1			-0.23835	-278.6	372.0	SB:Greenwood138 4# 962
														Open 126287 GOMANUS 345 126429 GOMANUS2T 138 1
														Open 126428 GOMANUS2R 138 126429 GOMANUS2T 138 1
														Open 126428 GOMANUS2R 138 126434 GREENWOOD 138 1
														Remove unit 1 from bus 126257 GOWGT1A 13.8 41.0 MW
														Remove unit 1 from bus 126259 GOWGT1B 13.8 39.7 MW
														Remove unit 1 from bus 126258 GOWGT3A 13.8 42.5 MW
														Remove unit 1 from bus 126289 GOWGT3B 13.8 42.9 MW



### **A.3 Capacity Delivery Capability at W49th Street**

### FCITC Single Study

PSS(R)MUST 10.2 -- Managing and Utilizing System Transmission -- SUN, OCT 23 2011 17:33 <PCT11.0>  
 2010 NYISO CLASS YEAR ATRA-D REV 3  
 2015 SUMMER PEAK LOAD M/ 2009 ERAG/MS9G & FJM RTEP 09 UPDATE  
 Case File C:\TDIQ05\CY2010\_ATRA\_Deliverability\_rev8\_UDRproxygen\_TDIQ05\_M49ST.sav  
 Subsys File C:\TDIQ05\Auxiliary files\CY2009\_CY2010\_.sub  
 Monit File C:\TDIQ05\Auxiliary files\CY2009\_CY2010\_.mon  
 Contin File C:\TDIQ05\Auxiliary files\CY2010\_ATRA\_.con  
 Exclud File C:\TDIQ05\Auxiliary files\cy2009-2010contingencies.exc

Interface-1 Interface 64 TDIQ049 Init.Flow= 158.54 TDF= 1.0000  
 Interface-2 Interface 65 AST345 Init.Flow= 827.48 TDF=-0.1106  
 Interface-3 Interface 66 M49345 Init.Flow= 158.54 TDF= 1.0000

From	To	Transfer Level	FCITC	EXPORT	Inter-face-1	Inter-face-2	Inter-face-3	LE From	LE To	Ckt	TDF	PreShi ft	Rating	Contingency	
TDIQ05	J EXP TDI	3000.0	-167.1	-8.5	-8.6	846	-8.6	Interface 24	Ontario-Mich		-0.07803	-13.0	0.0	126304 M 49 ST 345 148988 TDIQ05 345 1 91	
			-158.5	0.1	0.1	845	0.1	Interface 20	ABC-JK PAR-I		0.55223	87.5	0.0	Open 126304 M 49 ST 345 148988 TDIQ05 345 1	
			-158.4	0.2	0.1	845	0.1	Interface 20	ABC-JK PAR-I		0.12247	19.4	0.0	148988 TDIQ05 345 148991 TDIQ0CT3 16.5 1 483	
			-158.4	0.2	0.1	845	0.1	Interface 20	ABC-JK PAR-I		0.12247	19.4	0.0	Open 148988 TDIQ05 345 148991 TDIQ0CT3 16.5 1	
			199.2	357.8	357.7	805.4	357.7	126481	RAINEY8W	1126562	1	-0.21198	-213.8	256.0	Base Case
			201.1	359.8	359.7	805.2	359.7	126481	RAINEY8W	1126507	1	0.21198	213.4	256.0	Base Case
			416.5	575.1	575	781.4	575	126295	RAINEY	3126562	8	0.21804	165.2	256.0	Base Case
			430.7	589.3	589.2	779.8	589.2	126480	RAINEY8E	1126508	1	0.21775	157.2	251.0	Base Case
			431.6	590.2	590.1	779.7	590.1	126480	RAINEY8E	1126561	1	-0.21775	-158.0	252.0	Base Case
			440.4	599.1	599	778.8	599	126481	RAINEY8W	1126562	1	-0.21198	-278.6	372.0	SB:Greenwood138 4N 961
														Open 126287 GOMANUS 345 126429 GOMNUS2T 138 1	
														Open 126428 GOMNUS2R 138 126429 GOMNUS2T 138 1	
														Open 126428 GOMNUS2R 138 126434 GREENWOOD 138 1	
														Remove unit 1 from bus 126257 GOWGT1A 13.8 41.0 M	
														Remove unit 1 from bus 126259 GOWGT1B 13.8 39.7 M	
														Remove unit 1 from bus 126258 GOWGT3A 13.8 42.5 M	
														Remove unit 1 from bus 126289 GOWGT3B 13.8 42.9 M	
														Remove unit 1 from bus 128666 Q261SO PIER 13.8 64.0 M	
														Remove unit 1 from bus 126308 NARRGT2A 13.8 43.6 M	
														Remove unit 1 from bus 126309 NARRGT2B 13.8 44.3 M	
			442.4	601	600.9	778.5	600.9	126481	RAINEY8W	1126507	1	0.21198	278.2	372.0	SB:Greenwood138 4N 961
														Open 126287 GOMANUS 345 126429 GOMNUS2T 138 1	
														Open 126428 GOMNUS2R 138 126429 GOMNUS2T 138 1	
														Open 126428 GOMNUS2R 138 126434 GREENWOOD 138 1	
														Remove unit 1 from bus 126257 GOWGT1A 13.8 41.0 M	
														Remove unit 1 from bus 126259 GOWGT1B 13.8 39.7 M	
														Remove unit 1 from bus 126258 GOWGT3A 13.8 42.5 M	
														Remove unit 1 from bus 126289 GOWGT3B 13.8 42.9 M	
														Remove unit 1 from bus 128666 Q261SO PIER 13.8 64.0 M	
														Remove unit 1 from bus 126308 NARRGT2A 13.8 43.6 M	
														Remove unit 1 from bus 126309 NARRGT2B 13.8 44.3 M	
			442.8	601.4	601.3	778.5	601.3	126481	RAINEY8W	1126562	1	-0.21198	-278.1	372.0	SB:Greenwood138 4S 960
														Open 126426 GOMNUS1R 138 126434 GREENWOOD 138 1	
														Open 126426 GOMNUS1R 138 126427 GOMNUS1T 138 1	
														Open 126286 GOMANUS 345 126427 GOMNUS1T 138 1	
														Remove unit 1 from bus 126271 GOWGT2A 13.8 44.6 M	
														Remove unit 1 from bus 126328 GOWPT2B 13.8 44.3 M	
														Remove unit 1 from bus 126276 GOWPT4A 13.8 40.0 M	
														Remove unit 1 from bus 126329 GOWPT4B 13.8 41.5 M	
														Remove unit 1 from bus 147811 PACTG0M1 13.8 26.4 M	
														Remove unit 2 from bus 147812 PACTG0M2 13.8 26.8 M	
														Remove unit 1 from bus 126302 NARRCT1A 13.8 47.1 M	
														Remove unit 1 from bus 126303 NARRCT1B 13.8 44.8 M	
			444.7	603.3	603.2	778.3	603.2	126481	RAINEY8W	1126507	1	0.21198	277.7	372.0	SB:Greenwood138 4S 960
														Open 126426 GOMNUS1R 138 126434 GREENWOOD 138 1	



## A.4 Existing System Energy Deliverability Capability

**FCITC Single Study**

PSS(R)MUST 10.2 -- Managing and Utilizing System Transmission -- TUE, NOV 01 2011 10:35 <FCITL1.0>  
 2010 NYISO CLASS YEAR ATRA-D REV 3  
 2015 SUMMER PEAK LOAD W/ 2009 EPAG/MMMG & DJM RTEP 09 UPDATE  
 Case File C:\VTDI0305\CV2010 ATRA\_Deliverability\_rev0\_UD\Proxygen\_TDI6\_ExistingSystem\_ENERGYDELIVERY.sav  
 Subsys File C:\VTDI0305\Auxiliary files\cv2009\_cv2010\_sub  
 Monit File C:\VTDI0305\Auxiliary files\cv2009\_cv2010\_mon  
 Contin File C:\VTDI0305\Auxiliary files\cv2010\_ATRA\_A.COM  
 Exclud File C:\VTDI0305\Auxiliary files\cv2009-2010contingencies.exc

Interface-1 Interface 64 TDIQ3 Init.Flow= 576.10 TDF= 1.0000  
 Interface-2 Interface 65 AST345 Init.Flow= 985.12 TDF= 1.0000

From	To	Transfer Level	FCITC	EXPORT	Inter-face-1	Inter-face-2	LE From	LE To	Ckt	TDF	PreShift	Rating	Contingency
TDIQ305	J EXP TDI	1000.0	-503.4	-4.8	-7.3	401.7	Interface 24 Ontario-Mich			-0.07762	-45.3	0.0	147829 ASTOR345 345 148988 TDIQ305
			-501.8	-3.2	-5.7	403.3	Interface 24 Ontario-Mich			-0.07762	-45.2	0.0	Open 147829 ASTOR345 345 148988 TDIQ305 SB:AST 345 5 TDIQ305 & Q35M-48 Open 126275 E138T 48 345 126277 FARRAGUT Open 126275 E138T 48 345 147829 ASTOR345 Open 126275 E138T 48 345 126499 T11MPT Open 126275 E138T 48 345 126867 E13 X10 Open 147829 ASTOR345 345 148988 TDIQ305
			-501.4	-2.8	-5.3	403.7	Interface 24 Ontario-Mich			-0.07762	-45.1	0.0	SB:AST 345 3 TDIQ305 & Q35L-B47 Open 126274 E138T 47 345 126277 FARRAGUT Open 126274 E138T 47 345 147829 ASTOR345 Open 126274 E138T 47 345 126869 E13 X16 Open 126274 E138T 47 345 126870 E13 X17 Open 147829 ASTOR345 345 148988 TDIQ305
			-575.1	3.6	1	410.1	Interface 20 ABC-JR PAR-I			0.55528	319.3	0.0	147829 ASTOR345 345 148988 TDIQ305 Open 147829 ASTOR345 345 148988 TDIQ305
			-573.4	5.2	2.7	411.7	Interface 20 ABC-JR PAR-I			0.55527	318.4	0.0	SB:AST 345 5 TDIQ305 & Q35M-48 Open 126275 E138T 48 345 126277 FARRAGUT Open 126275 E138T 48 345 147829 ASTOR345 Open 126275 E138T 48 345 126499 T11MPT Open 126275 E138T 48 345 126867 E13 X10 Open 147829 ASTOR345 345 148988 TDIQ305
			-573.3	5.3	2.8	411.8	Interface 20 ABC-JR PAR-I			0.55524	318.3	0.0	SB:AST 345 3 TDIQ305 & Q35L-B47 Open 126274 E138T 47 345 126277 FARRAGUT Open 126274 E138T 47 345 147829 ASTOR345 Open 126274 E138T 47 345 126869 E13 X16 Open 126274 E138T 47 345 126870 E13 X17 Open 147829 ASTOR345 345 148988 TDIQ305
			-364.1	214.5	212	621	126275 E138T 48 345 147829 ASTOR345	345 1	-1.00000	-985.1	621.0	126274 E138T 47 345 147829 ASTOR345	Open 126274 E138T 47 345 147829 ASTOR345 Open 126274 E138T 47 345 147829 ASTOR345
			-364.1	214.5	212	621	126274 E138T 47 345 147829 ASTOR345	345 1	-1.00000	-985.1	621.0	126275 E138T 48 345 147829 ASTOR345	Open 126275 E138T 48 345 147829 ASTOR345
			-364.1	214.5	212	621	126274 E138T 47 345 147829 ASTOR345	345 1	-1.00000	-985.1	621.0	SB:FARR 345 2W FGT TR-48-Q35M Open 126275 E138T 48 345 126277 FARRAGUT Open 126275 E138T 48 345 147829 ASTOR345 Open 126275 E138T 48 345 126499 T11MPT Open 126275 E138T 48 345 126867 E13 X10 Open 126277 FARRAGUT 345 126407 FGT Y6 Open 126277 FARRAGUT 345 126411 FGT X4	
			-364.1	214.5	212	621	126274 E138T 47 345 147829 ASTOR345	345 1	-1.00000	-985.1	621.0	SB:ASTORIA-E13th-Farragut Q35M48 345 Open 126275 E138T 48 345 126277 FARRAGUT Open 126275 E138T 48 345 147829 ASTOR345 Open 126275 E138T 48 345 126499 T11MPT Open 126275 E138T 48 345 126867 E13 X10	
			-364.1	214.5	212	621	126274 E138T 47 345 147829 ASTOR345	345 1	-1.00000	-985.1	621.0	SB:FARR 345 2W Open 126275 E138T 48 345 126277 FARRAGUT Open 126275 E138T 48 345 147829 ASTOR345 Open 126275 E138T 48 345 126499 T11MPT Open 126275 E138T 48 345 126867 E13 X10 Open 126277 FARRAGUT 345 126407 FGT Y6 Open 126277 FARRAGUT 345 126411 FGT X4	
			-364.1	214.5	212	621	126274 E138T 47 345 147829 ASTOR345	345 1	-1.00000	-985.1	621.0	SB:FARR 345 2W Open 126275 E138T 48 345 126277 FARRAGUT Open 126275 E138T 48 345 147829 ASTOR345 Open 126275 E138T 48 345 126499 T11MPT Open 126275 E138T 48 345 126867 E13 X10 Open 126277 FARRAGUT 345 126405 FGT V4 Open 126277 FARRAGUT 345 126413 FGT X6	
			-364.1	214.5	212	621	126274 E138T 47 345 147829 ASTOR345	345 1	-1.00000	-985.1	621.0	SB:FARR 345 2W FGT TR-48-Q35M	



## **A.5 Energy Deliverability Capability With Astoria-Rainey 345 kV Cable**





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Appendix

**B**

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## **Generation Changes for 1,578 MW Astoria 345 kV Export**

Generation Changes for 1,578 MW Astoria 345 kV Export

Bus#	BusName	KV	Dispatch for Capacity			Dispatch for Energy			Net Difference
			Pgen	NewGen	Change	Pgen	NewGen	Change	
126251	ER G6	13.2	78.1	71.7	-6.4	78.1	69.7	-8.4	-2.0
126252	ER G7	13.2	107.4	98.6	-8.8	107.4	95.9	-11.5	-2.7
126254	AWGT1	13.8	28.2	25.9	-2.3	28.2	28.2		2.3
126255	AWGT2	13.8	27.2	24.9	-2.2	27.2	27.2		2.3
126257	GOWGT1A	13.8	41.0	37.6	-3.4	41.0	36.6	-4.4	-1.0
126258	GOWGT3A	13.8	42.5	39.0	-3.5	42.5	38.0	-4.6	-1.0
126259	GOWGT1B	13.8	39.7	36.4	-3.3	39.7	35.4	-4.3	-1.0
126265	COGNTECH	345	300.0	270.7	-29.3	300.0	261.7	-38.3	-9.0
126271	GOWGT2A	13.8	44.6	40.9	-3.7	44.6	39.8	-4.8	-1.1
126276	GOWGT4A	13.8	40.0	36.7	-3.3	40.0	35.7	-4.3	-1.0
126289	GOWGT3B	13.8	42.9	39.3	-3.5	42.9	38.3	-4.6	-1.0
126302	NARRGT1A	13.8	47.1	43.2	-3.9	47.1	42.1	-5.1	-1.1
126303	NARRGT1B	13.8	44.8	41.1	-3.7	44.8	40.0	-4.8	-1.1
126308	NARRGT2A	13.8	43.6	40.0	-3.6	43.6	38.9	-4.7	-1.1
126309	NARRGT2B	13.8	44.3	40.7	-3.6	44.3	39.6	-4.8	-1.1
126311	ASTEGT2A	13.8	48.6	44.6	-4.0	48.6	43.4	-5.2	-1.2
126312	ASTEGT2B	13.8	47.8	43.9	-3.9	47.8	42.7	-5.1	-1.2
126322	ASTEGT3A	13.8	49.3	45.2	-4.0	49.3	44.0	-5.3	-1.2
126323	ASTEGT3B	13.8	50.0	45.9	-4.1	50.0	44.7	-5.4	-1.2
126325	ASTEGT4A	13.8	48.9	44.8	-4.0	48.9	43.6	-5.2	-1.2
126326	ASTEGT4B	13.8	48.8	44.8	-4.0	48.8	43.6	-5.2	-1.2
126328	GOWGT2B	13.8	44.3	40.7	-3.6	44.3	39.6	-4.8	-1.1
126329	GOWGT4B	13.8	41.5	38.1	-3.4	41.5	37.0	-4.4	-1.1
126340	KEYSPG-1	18	89.6	82.2	-7.4	89.6	89.6		7.4
126341	KEYSPST1	18	44.9	41.2	-3.7	44.9	44.9		3.7
126344	W59TH GT1	13.8	9.0	8.2	-0.7	9.0	8.0	-1.0	-0.2
126379	AST 2	13.8	102.9	94.5	-8.5	102.9	91.9	-11.0	-2.6
126468	ERGT1	18	86.4	79.3	-7.1	86.4	77.1	-9.3	-2.2
126469	ERGT2	18	87.5	80.3	-7.2	87.5	78.1	-9.4	-2.2
126564	KENTGEN	13.8	46.5	42.7	-3.8	46.5	46.5		3.8
126588	E74 GT1	13.8	11.5	10.5	-0.9	11.5	10.2	-1.2	-0.3
126589	E74 GT2	13.8	11.3	10.4	-0.9	11.3	10.1	-1.2	-0.3
126606	COOP CITY	13.8	23.3	21.4	-1.9	23.3	20.8	-2.5	-0.6
126650	AK 3	22	303.1	278.2	-24.9	303.1	270.6	-32.6	-7.6
126652	RAV 3	22	573.9	526.8	-47.1	441.6	396.9	-44.6	-129.9
126653	AK 2	20	208.7	191.5	-17.2	208.7	186.3	-22.4	-5.2
126654	AST 3	20	215.1	197.5	-17.7	215.1	215.1		17.6
126655	AST 4	20	218.5	200.5	-17.9	218.5	195.0	-23.4	-5.5
126656	AST 5	20	218.9	200.9	-18.0	218.9	218.9		18.0
126657	RAV 1	20	212.4	194.9	-17.4	212.4	212.4		17.5
126658	RAV 2	20	227.8	209.1	-18.7	359.8	359.8		150.7
126659	COGENGT1	13.8	53.2	48.8	-4.4	53.2	47.5	-5.7	-1.3
126660	COGENGT2	13.8	53.2	48.8	-4.4	53.2	47.5	-5.7	-1.3
126661	COGENGT3	13.8	53.2	48.8	-4.4	53.2	47.5	-5.7	-1.3
126662	COGENGT4	13.8	53.2	48.8	-4.4	53.2	47.5	-5.7	-1.3
126663	COGENGT5	13.8	53.2	48.8	-4.4	53.2	47.5	-5.7	-1.3
126664	COGENST1	13.8	57.3	52.6	-4.7	57.3	51.2	-6.1	-1.4
126665	COGENST2	13.8	57.3	52.6	-4.7	57.3	51.2	-6.1	-1.4
126666	COGENST3	13.8	57.3	52.6	-4.7	57.3	51.2	-6.1	-1.4
126674	JFK G1	13.8	25.9	23.8	-2.1	25.9	23.2	-2.8	-0.6

Generation Changes for 1,578 MW Astoria 345 kV Export

Bus#	BusName	KV	Dispatch for Capacity			Dispatch for Energy			Net Difference
			Pgen	NewGen	Change	Pgen	NewGen	Change	
126675	JFK G2	13.8	25.9	23.8	-2.1	25.9	23.2	-2.8	-0.6
126676	JFK G3	13.8	16.2	14.8	-1.3	16.2	14.4	-1.7	-0.4
126677	RNYGT4-7	13.8	37.3	34.2	-3.1	37.3	37.3		3.1
126678	RYYGT811	13.8	48.6	44.6	-4.0	48.6	43.4	-5.2	-1.2
126683	YORK G4	13.8	43.3	39.7	-3.6	43.3	38.7	-4.6	-1.0
126684	YORK G1	13.8	34.3	31.5	-2.8	34.3	30.6	-3.7	-0.9
126685	YORK G2	13.8	34.3	31.5	-2.8	34.3	30.6	-3.7	-0.9
126686	YORK G3	13.8	43.3	39.7	-3.6	43.3	38.7	-4.6	-1.0
126692	SCS18-G4	18	114.0	104.6	-9.4	114.0	101.8	-12.2	-2.8
126710	SCS18-G5	18	114.0	104.6	-9.4	114.0	101.8	-12.2	-2.8
126711	SCS18-G6	18	96.0	88.1	-7.9	96.0	85.7	-10.3	-2.4
126712	ASTGT5	13	9.3	8.5	-0.8	9.3	8.3	-1.0	-0.2
126713	ASTGT7-8	13	17.9	16.4	-1.5	17.9	16.0	-1.9	-0.4
126736	RNY 2EGT	13	42.7	39.2	-3.5	42.7	38.2	-4.6	-1.0
126737	RNY 7EGT	13	45.7	42.0	-3.8	45.7	40.8	-4.9	-1.2
126738	RNY 7WGT	13	45.9	42.2	-3.8	45.9	41.0	-4.9	-1.2
126739	RNY 9EGT	13	45.4	41.6	-3.7	45.4	40.5	-4.9	-1.1
128749	Q206_HUDSN	345	660.0	595.5	-64.5	660.0	575.8	-84.2	-19.7
147788	POLETGT2	18	101.8	93.4	-8.4	101.8	101.8		8.4
147789	POLETSTG	18	82.7	75.9	-6.8	82.7	82.7		6.8
147790	POLETGT1	18	101.8	93.4	-8.4	101.8	101.8		8.4
147810	PAGTFOXH	13.8	27.4	25.1	-2.2	27.4	24.5	-2.9	-0.6
147811	PAGTGOW1	13.8	26.4	24.2	-2.2	26.4	23.6	-2.8	-0.6
147812	PAGTGOW2	13.8	26.8	24.6	-2.2	26.8	23.9	-2.9	-0.7
147813	PAGTHG41	13.8	26.8	24.6	-2.2	26.8	23.9	-2.9	-0.7
147814	PAGTHG42	13.8	26.3	24.1	-2.2	26.3	23.5	-2.8	-0.6
147815	PAGTHG11	13.8	26.2	24.0	-2.2	26.2	23.4	-2.8	-0.6
147816	PAGTHG12	13.8	26.2	24.0	-2.2	26.2	23.4	-2.8	-0.6
147817	PAGTVNGW	13.8	27.4	25.1	-2.2	27.4	27.4		2.3
147818	PAGTVER1	13.8	26.9	24.7	-2.2	26.9	26.9		2.2
147819	PAGTVER2	13.8	25.5	23.4	-2.1	25.5	25.5		2.1
128253	BAY_G1	13.8	37.2	33.6	-3.6	37.2	32.5	-4.8	-1.1
128254	BAY_G3	13.8	37.2	33.6	-3.6	37.2	32.5	-4.8	-1.1
128255	BAY_G5	13.8	37.2	33.6	-3.6	37.2	32.5	-4.8	-1.1
128256	BAY_G7	13.8	37.2	33.6	-3.6	37.2	32.5	-4.8	-1.1
138253	BAY_G2	13.8	37.2	33.6	-3.6	37.2	32.5	-4.8	-1.1
138254	BAY_G4	13.8	37.2	33.6	-3.6	37.2	32.5	-4.8	-1.1
138255	BAY_G6	13.8	37.2	33.6	-3.6	37.2	32.5	-4.8	-1.1
138256	BAY_G8	13.8	37.2	33.6	-3.6	37.2	32.5	-4.8	-1.1
128666	Q261SO_PIER	13.8	64.0	57.7	-6.3	64.0	55.8	-8.2	-1.9
TOTALS			6893.6	6305.9	-586.9	6893.3	6307.1	-587.3	1.2

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