# Generation Interconnection Feasibility Study Report Queue Position AE2-112

The Interconnection Customer (IC) has proposed a 20.0 MW Energy (7.6 MW Capacity) upgrade to prior queue project AD2-076 a solar generating facility to be located at Latitude: 39.0445330, Longitude: -76.0085710 in Queen Anne's County, Maryland. PJM studied the AE2-112 project as an injection into the Delmarva Power & Light Company (DPL) transmission system at the Carville Substation (PSSE # 232105) and evaluated it for compliance with reliability criteria for summer peak conditions in 2022. The project was studied at a commercial probability of 53%. The planned inservice date, as requested by the IC, is November 30, 2021. This date may not be attainable due to required PJM studies (System Impact and Facilities) and the Transmission Owner's construction schedule.

## **Point of Interconnection**

The Interconnection Customer requested a transmission level Point of Interconnection (POI) be evaluated for the AE2-112 project at the same POI as prior queue project AD2-076. As a result, the AE2-112 project will connect with the DPL transmission system at the Carville 138 kV Substation.

## **Transmission Owner Scope of Work**

There is no additional Transmission Owner work scope beyond what was already identified in the AD2-076 report. In the event that the AD2-076 project does not move forward, the AE2-112 project will be responsible for those costs.

#### **Required Relaying and Communications**

As required by prior queue project AD2-076.

#### **Metering**

As required by prior queue project AD2-076.

#### **Interconnection Customer Scope of Direct Connection Work**

The IC is responsible for all design and construction related to activities on their side of the Point of Interconnection. Site preparation, including grading and an access road, as necessary, is assumed to be by the IC. Route selection, line design, and right-of-way acquisition of the direct connect facilities is not included in this report, and is the responsibility of the IC. Protective relaying and metering design and installation must comply with DPL's applicable standards. The IC is also required to provide revenue metering and real-time telemetering data to PJM in conformance with the requirements contained in PJM Manuals M-01 and M-14 and the PJM Tariff.

#### **DPL Interconnection Customer Scope of Direct Connection Work Requirements:**

• DPL requires that an IC circuit breaker is located within 500 feet of the DPL substation to facilitate the relay protection scheme between DPL and the IC at the Point of Interconnection (POI).

## **Special Operating Requirements**

- 1. DPL will require the capability to remotely disconnect the generator from the grid by communication from its System Operations facility. Such disconnection may be facilitated by a generator breaker, or other method depending upon the specific circumstances and the evaluation by DPL.
- 2. DPL reserves the right to charge the Interconnection Customer operation and maintenance expenses to maintain the Interconnection Customer attachment facilities, including metering and telecommunications facilities, owned by DPL.

## **Summer Peak Analysis - 2022**

## **Transmission Network Impacts**

Potential transmission network impacts are as follows:

## **Generator Deliverability**

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

None

## **Multiple Facility Contingency**

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies for the full energy output)

None

#### **Contribution to Previously Identified Overloads**

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Туре	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
1819011	232100	CHURCH	DP&L	232107	TOWNSEND	DP&L	1	DPL_P7_1_DBL_1NCB- A	tower	348.0	101.75	104.28	DC	8.82

## **Summer Peak Load Flow Analysis Reinforcements**

#### **System Reinforcements**

(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)

ID	Index	Facility	Upgrade Description	Cost	
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ID	Index	Facility	Upgrade Description	Cost
1819011	1	CHURCH 138.0 kV - TOWNSEND 138.0 kV Ckt 1	ds13833r0001 (39): To mitigate the (DP&L) CHURCH to TOWNSEND 138 kV line (from bus 232100 to bus 232107 ckt 1) overload will require substation reinforcements at Church Substation.  Project Type: FAC Cost: \$500,000 Time Estimate: 24-36 Months	\$500,000
			TOTAL COST	\$500,000

## **Short Circuit**

No issues identified.

## **Stability and Reactive Power Requirement**

To be performed during later study phases as required.

## <u>Light Load Analysis - 2022</u>

To be performed during later study phases (as required by PJM Manual 14B).

## **Delivery of Energy Portion of Interconnection Request**

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request. Only the most severely overloaded conditions are listed. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed, which will study all overload conditions associated with the overloaded element(s) identified.

None

#### **Delmarva Power and Light Costs**

Cost estimates will further be refined as a part of the Impact Study and Facilities Study for this project. The Interconnection Customer will be responsible for all costs incurred by DPL in connection with the AE2-112 project.

## Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for

convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact. It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

#### Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Туре	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
1819011	232100	CHURCH	DP&L	232107	TOWNSEND	DP&L	1	DPL_P7_1_DBL_1NCB-	tower	348.0	101.75	104.28	DC	8.82

Bus #	Bus	MW Impact
232813	VAUGHN	0.08
232902	EASTMUNI	2.61
232907	VN8	4.17
232910	NRG_G1	1.29
232911	NRG_G2	1.29
232916	OH NUG5	0.68
232919	VN10	0.24
232922	MR3	10.61
232926	CRISFLD1	0.25
293670	O-025 C	0.15
901003	W1-003 C	0.38
901004	W1-003 E	0.91
901013	W1-004 C	0.38
901014	W1-004 E	0.91
901023	W1-005 C	0.38
901024	W1-005 E	0.91
901033	W1-006 C	0.38
901034	W1-006 E	0.91
907052	X1-032 E	0.81
910571	X3-008 C	0.23
910572	X3-008 E	3.07
910821	X3-066 C	0.12
910822	X3-066 E	1.58
913361	Y1-079 C	0.17
913362	Y1-079 E	2.3
913411	Y1-080 C	0.04
913412	Y1-080 E	0.49
915541	Y3-058 C	0.15
915542	Y3-058 E	1.94
917082	Z2-012 E	2.48
917432	Z2-076 E	0.38
917442	Z2-077 E	0.38
918831	AA1-102	0.93
919831	AA2-069	46.93
920321	AA2-130	0.05

Bus #	Bus	MW Impact
923921	AB2-032 C	6.29
923922	AB2-032 E	2.96
923951	AB2-036 C	12.67
923952	AB2-036 E	20.72
923961	AB2-037 C	19.91
923962	AB2-037 E	32.52
924191	AB2-063 C	3.22
924192	AB2-063 E	5.26
924681	AB2-120 C	7.58
924682	AB2-120 E	12.37
924781	AB2-130 C O1	6.47
924782	AB2-130 E O1	10.56
924801	AB2-133 C O1	11.61
924802	AB2-133 E O1	14.73
924821	AB2-135 C	12.37
924822	AB2-135 E	14.11
924831	AB2-136 C	5.89
924832	AB2-136 E	6.25
924971	AB2-153 C	3.52
924972	AB2-153 E	5.74
925151	AB2-172 C	4.7
925152	AB2-172 E	7.67
925261	AB2-180 C	2.93
925262	AB2-180 E	1.25
925271	AB2-185 C	5.2
925272	AB2-185 E	2.23
926911	AC1-177	0.82
927031	AC1-190 C	8.58
927032	AC1-190 E	3.68
927191	AC1-213 C	0.65
927192	AC1-213 E	0.43
930202	AB1-056 E O1	33.09
930881	AB1-137 C	0.77
930882	AB1-137 E	0.33
930921	AB1-141 C	6.24
930922	AB1-141 E	2.91
930931	AB1-142 C	6.24
930932	AB1-142 E	2.91
931111	AB1-162 C	2.69
931112	AB1-162 E	4.39
931261	AB1-176 C	1.44
931262	AB1-176 E	2.37
932161	AC2-023 C	5.63
932162	AC2-023 E	4.1
933641	AC2-186 C	3.69
933642	AC2-186 E	6.01
936611	AD2-076 C O1	8.21
936612	AD2-076 E O1	13.4
936691	AD2-088 C O1	3.61
936692	AD2-088 E O1	2.41
938251	AE1-038 C O1	0.87
938252	AE1-038 E O1	1.21

938651 A£1-087 E 0.99 938851 A£1-1087 E 0.99 938851 A£1-1087 E 0.99 938851 A£1-117 C 01 8.81 938892 A£1-118 C 01 23.49 938801 A£1-118 C 01 23.51 938002 A£1-118 E 01 23.51 938151 A£1-145 C 1 2.39 939152 A£1-145 C 1 1.6 939152 A£1-145 C 1 1.6 939361 A£1-145 E 0 0.04 939361 A£1-167 C 01 1.2 939362 A£1-167 C 01 1.2 939362 A£1-167 C 01 1.0 939362 A£1-167 C 01 1.0 939362 A£1-167 C 01 1.0 939362 A£1-167 E 01 4.6 941021 A£2-093 E 9.42 941021 A£2-093 E 9.42 941181 A£2-112 E 5.47 941971 A£2-209 E 9.42 941182 A£2-112 E 5.47 941971 A£2-209 E 7.65 941972 A£2-209 E 5.33 942441 A£2-257 C 01 6.04 942442 A£2-57 E 01 1.59 942701 A£2-286 E 1.83 942702 A£2-286 E 1.83 942702 A£2-286 E 1.83 942702 A£2-286 E 1.83 942702 A£2-286 E 0.65 942701 A£2-286 E 0.65 942701 A£2-286 E 0.65 942821 A£2-301 C 0.82 942821 A£2-301 C 0.82 942822 A£2-301 C 0.82 942821 A£2-301 C 0.82 942822 A£2-301 C 0.82 942822 A£2-301 C 0.82 942822 A£2-301 C 0.82 942822 A£2-301 C 0.82 942824 A£2-301 C 0.82 942826 C 1.83 942702 A£2-86 E 0.65 942821 A£2-301 C 0.82 942821 A£2-301 C 0.82 942822 A£2-301 C 0.82 942821 A£2-301 C 0.82 942822 A£2-301 C 0.82 942822 A£2-301 C 0.82 942821 A£2-301 C 0.82 942822 A£2-301 C 0.82 942821 A£2-301 C 0.82 942821 A£2-301 C 0.82 942822 A£2-301 C 0.82 942821 A£2-301 C 0.82 942822 A£2-301 C 0.82 942821 A£2-301 C 0.82 942821 A£2-301 C 0.82 942822 A£2-301 C 0.82 942824 A£2-301 C 0.82 942824 A£2-301 C 0.82 942824 A£2-301 C 0.82 942825 A£2-301 C 0.82 942826 A£2-301 C 0.82 942826 A£2-301 C 0.82 942827 A£2-301 C 0.82 942828 A£2-301 C 0.82 942828 A£2-301 C 0.82 942829 A£2-286 E 0.65 942821 A£2-301 C 0.82 942821 A£2-301 C 0.82 942821 A£2-301 C 0.82 942821 A£2-30	Bus #	Bus	MW Impact
938891	938651	AE1-087 C	3.96
93892	938652	AE1-087 E	0.99
938901   AE1-118 C O	938891	AE1-117 C O1	8.81
938902   AE1-118 E 01   23.51     939151   AE1-145 C1   2.39     939152   AE1-145 C2   1.6     939153   AE1-145 E   0.04     939361   AE1-167 C 01   1.2     939362   AE1-167 E 01   1.0     939362   AE1-192 C 01   9.39     939622   AE1-192 C 01   9.39     939622   AE1-192 C 01   4.6     941021   AE2-093 C   5.93     941022   AE2-093 E   9.42     941181   AE2-112 C   3.35     941182   AE2-112 E   5.47     941971   AE2-200 C   7.65     941972   AE2-200 E   5.33     942441   AE2-200 C   7.65     943972   AE2-200 E   5.33     942441   AE2-257 C 01   6.04     942442   AE2-257 C 01   15.93     942701   AE2-286 C   1.83     942702   AE2-286 E   2.65     942821   AE2-301 C   0.82     942822   AE2-301 E   1.24     BLUEG   BLUEG   0.96     CALDERWOOD   CALDERWOOD   0.1     CANNELTON   CANNELTON   0.06     CARR   CARR   0.05     CATAWBA   CATAWBA   0.07     CHEOAH   CHEOAH   0.1     CHILHOWEE   0.03     COFFEEN   COFFEEN   0.1     CHILHOWEE   CHILHOWEE   0.03     COFFEEN   COFFEEN   0.1     CHILHOWEE   CHILHOWEE   0.03     COFFEEN   COFFEEN   0.1     CHILHOWEE   CHILHOWEE   0.03     COFFEEN   COFFEEN   0.1     CHEOAH   CHEOAH   0.1     CHILHOWEE   CHILHOWEE   0.03     COFFEEN   COFFEEN   0.1     CHEOAH   CHEOAH   0.1     CHILHOWEE   CHILHOWEE   0.03     COFFEEN   COFFEEN   0.1     COTTONWOOD   0.4     DUCKCREEK   DUCKCREEK   0.22     EDWARDS   EDWARDS   0.1     ELIMERSMITH   ELIMERSMITH   0.1     FARMERCITY   FARMERCITY   0.07     GIBSON   GIBSON   0.04     HANLET   HANLET   1.11     NEWTON   NEWTON   0.26     O.066   0.066   0.065     PRAIRIE   PRAIRIE   0.49     RENSSELAER   RENSSELAER   0.04     SMITHLAND   0.04     TATANKA   TATANKA   0.12     TILTON   TILTON   0.12     TRIMBLE   TIMBLE   0.11	938892	AE1-117 E O1	23.49
939151   AE1-145 C1   2.39   939152   AE1-145 C2   1.6       939153   AE1-145 E   0.04       939361   AE1-167 C01   1.2       939362   AE1-167 C01   1.0       939362   AE1-167 C01   1.0       939362   AE1-192 C01   9.39       939562   AE1-192 E 01   4.6       941021   AE2-093 C   5.93       941021   AE2-093 E   9.42       941021   AE2-093 E   9.42       941181   AE2-112 C   3.35       941182   AE2-112 E   5.47       941971   AE2-209 C   7.65       941972   AE2-209 E   5.33       942441   AE2-257 C 01   6.04       942442   AE2-257 C 01   6.04       942442   AE2-257 C 01   6.04       942200   AE2-286 C   1.83       942701   AE2-286 C   1.83       942702   AE2-286 E   2.65       942821   AE2-301 C   0.82       942821   AE2-301 E   1.24       BUUGG   BUUGG   0.96       CAIDERWOOD   CALDERWOOD   0.1       CANNELTON   CANNELTON   0.06       CANNELTON   CANNELTON   0.06       CATAWBA   CATAWBA   0.07       CHEOAH   CHEOAH   0.1       CHILHOWEE   CHILHOWEE   0.03       COFFEEN   COFFEEN   0.1       COTTONWOOD   CALDERWOOD   0.4       CHILHOWEE   CHILHOWEE   0.03       COFFEEN   COFFEEN   0.1       COTTONWOOD   COTTONWOOD   0.4       DUCKCREEK   0.22       EUMERSMITH   ELMERSMITH   0.1       FARMERCITY   FARMERCITY   0.07       G-007   G-007   G-007   0.07       G-006   O-066   O-066   0.65       PRAIRIE   PRAIRIE   0.49       RENSSLAER   RENSSLAER   0.04       AE1-192   COTTONWOOD   0.12       TILTON   TILTON   0.12       TILTON   0.34	938901	AE1-118 C O1	8.81
939152   AE1-145 C2   1.6     939361   AE1-145 E   0.04     939362   AE1-167 C01   1.2     939362   AE1-167 E01   1.0     939362   AE1-192 C01   9.39     939622   AE1-192 C01   4.6     941021   AE2-093 C   5.93     941022   AE2-093 E   9.42     941181   AE2-112 C   3.35     941182   AE2-112 C   3.35     9411971   AE2-209 C   7.65     941971   AE2-209 C   7.65     941972   AE2-209 E   5.33     942441   AE2-257 C01   6.04     942442   AE2-257 C01   15.93     942701   AE2-286 C   1.83     942701   AE2-286 C   1.83     942702   AE2-286 E   2.65     942821   AE2-301 C   0.82     942822   AE2-301 C   0.82     942822   AE2-301 C   0.82     942822   AE2-301 C   0.96     CALDERWOOD   CALDERWOOD   0.1     CANNELTON   CANNELTON   0.06     CARR   CARR   0.05     CATAWBA   CATAWBA   0.07     CHEOAH   CHEOAH   0.1     CHIHOWEE   CHILHOWEE   0.03     COTTONWOOD   CATAWBA   0.07     CHEOAH   CHEOAH   0.1     CHIHOWEE   CHILHOWEE   0.03     COTTONWOOD   0.4     DUCKCREEK   DUCKCREEK   0.22     EDWARDS   EDWARDS   0.1     ELIMESNITH   ELIMESNITH   0.1     FARMERCITY   FARMERCITY   0.07     GIBSON   GIBSON   0.04     HANLET   HANLET   0.11     NEWTON   NEWTON   0.26     PRAIRIE   PRAIRIE   0.49     RENSSELAER   RENSSELAER   0.04     SMITHLAND   SMITHLAND   0.04     TATAMKA   TATAMKA   0.12     TILTON   TILTON   0.12     TRIMBLE   TRIMBLE   0.11	938902	AE1-118 E O1	23.51
939153   AE1-145 E   0.04     939361   AF1-167 C O	939151	AE1-145 C1	2.39
939361   AE1-167 C O	939152	AE1-145 C2	1.6
939362	939153	AE1-145 E	0.04
939621	939361	AE1-167 C O1	1.2
939622   AE1-192 E O	939362	AE1-167 E O1	1.0
941021	939621	AE1-192 C O1	9.39
941022         AE2-093 E         9.42           941181         AE2-112 C         3.35           941182         AE2-112 E         5.47           941971         AE2-209 C         7.65           941972         AE2-209 E         5.33           942441         AE2-257 C O1         6.04           942442         AE2-257 E O1         15.93           942701         AE2-286 E         2.65           942821         AE2-301 C         0.82           942821         AE2-301 E         1.24           BLUEG         BUEG         0.96           CALDERWOOD         CALDERWOOD         0.1           CANRELTON         CANRELTON         0.06           CARR         CARR         0.05           CATAWBA         CATAWBA         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         CHILHOWEE         0.03           COFFEEN         COFFEEN         0.1           COTTONWOOD         COTTONWOOD         0.4           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1	939622	AE1-192 E O1	4.6
941181         AE2-112 C         3.35           941182         AE2-112 E         5.47           941971         AE2-209 C         7.65           941972         AE2-209 E         5.33           942441         AE2-257 C O1         6.04           942402         AE2-257 E O1         15.93           942701         AE2-286 C         1.83           942702         AE2-286 E         2.65           942821         AE2-301 C         0.82           942822         AE2-301 E         1.24           BLUEG         BUEG         0.96           CALDERWOOD         CALDERWOOD         0.1           CANNELTON         C.06         0.06           CARR         CARR         0.05           CATAWBA         CATAWBA         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         CHILHOWEE         0.03           COFFEEN         0.1         COTTONWOOD           COFFEEN         0.1         COTTONWOOD           COTTONWOOD         0.4         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1 <th>941021</th> <th>AE2-093 C</th> <th>5.93</th>	941021	AE2-093 C	5.93
941182         AE2-112 E         5.47           941971         AE2-209 C         7.65           941972         AE2-209 E         5.33           942441         AE2-257 C O1         6.04           942442         AE2-257 C O1         15.93           942701         AE2-286 C         1.83           942702         AE2-286 E         2.65           942821         AE2-301 C         0.82           942822         AE2-301 E         1.24           BLUEG         BLUEG         0.96           CALDERWOOD         0.1         1.2           CANNELTON         0.06         0.1           CANNELTON         0.06         0.0           CATAWBA         CATAWBA         0.07           CATAWBA         CATAWBA         0.07           CHEOAH         CHILHOWEE         0.03           COFFEEN         0.1         0.1           COTTONWOOD         COTTONWOOD         0.4           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07	941022	AE2-093 E	9.42
941182         AE2-112 E         5.47           941971         AE2-209 C         7.65           941972         AE2-209 E         5.33           942441         AE2-257 C O1         6.04           942442         AE2-257 C O1         15.93           942701         AE2-286 C         1.83           942702         AE2-286 E         2.65           942821         AE2-301 C         0.82           942822         AE2-301 E         1.24           BLUEG         BLUEG         0.96           CALDERWOOD         0.1         1.2           CANNELTON         0.06         0.1           CANNELTON         0.06         0.0           CATAWBA         CATAWBA         0.07           CATAWBA         CATAWBA         0.07           CHEOAH         CHILHOWEE         0.03           COFFEEN         0.1         0.1           COTTONWOOD         COTTONWOOD         0.4           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07			
941972         AE2-209 E         5.33           942441         AE2-257 C O1         6.04           942442         AE2-257 E O1         15.93           942701         AE2-286 C         1.83           942702         AE2-286 E         2.65           942821         AE2-301 C         0.82           942822         AE2-301 E         1.24           BLUEG         BLUEG         0.96           CALDERWOOD         0.1         1.2           CANRELTON         0.06         0.05           CARR         CARR         0.05           CATAWBA         CATAWBA         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         0.03         0.0           COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4         0.1           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         0.1         0.1           FARMERCITY         0.07         0.07           G-007         G-007         0.07           G-050         O-066         0.65           PRAIRIE         PRAIRIE <th>941182</th> <th>AE2-112 E</th> <th>5.47</th>	941182	AE2-112 E	5.47
941972         AE2-209 E         5.33           942441         AE2-257 C O1         6.04           942442         AE2-257 E O1         15.93           942701         AE2-286 C         1.83           942702         AE2-286 E         2.65           942821         AE2-301 C         0.82           942822         AE2-301 E         1.24           BLUEG         BLUEG         0.96           CALDERWOOD         0.1         1.2           CANRELTON         0.06         0.05           CARR         CARR         0.05           CATAWBA         CATAWBA         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         0.03         0.0           COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4         0.1           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         0.1         0.1           FARMERCITY         0.07         0.07           G-007         G-007         0.07           G-050         O-066         0.65           PRAIRIE         PRAIRIE <th></th> <th></th> <th></th>			
942442   AE2-257 E O 1   15.93     942701   AE2-286 C   1.83     942702   AE2-286 E   2.65     942821   AE2-301 C   0.82     942822   AE2-301 E   1.24     BLUEG   BLUEG   0.96     CALDERWOOD   C.1     CANNELTON   CANNELTON   0.06     CARR   CARR   0.05     CATAWBA   CATAWBA   0.07     CHEOAH   CHEOAH   0.1     CHILHOWEE   CHILHOWEE   0.03     COFFEEN   COFFEEN   0.1     COTTONWOOD   COTTONWOOD   0.4     DUCKCREK   DUCKCREK   0.22     EDWARDS   EDWARDS   0.1     ELMERSMITH   ELMERSMITH   0.1     FARMERCITY   FARMERCITY   0.07     G-007   G-007   0.07     GBSON   GIBSON   0.04     HAMLET   HAMLET   0.11     NEWTON   0.26   0.066     O-066   O-066   0.65     PRAIRIE   PRAIRIE   0.49     RENSSELAER   RENSSELAER   0.04     SANTEETLA   SANTEETLA   0.03     SMITHLAND   SMITHLAND   0.12     TILTON   TILTON   0.12     TRIMBLE   TRIMBLE   0.11     TVA   TVA   0.34	941972		5.33
942701         AE2-286 E         2.65           942702         AE2-286 E         2.65           942821         AE2-301 C         0.82           942822         AE2-301 E         1.24           BLUEG         BLUEG         0.96           CALDERWOOD         0.1         0.06           CARR         CARR         0.05           CARR         CARR         0.05           CATAWBA         CATAWBA         0.07           CHEOAH         0.1         0.1           CHILHOWEE         CHILHOWEE         0.03           COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4         0.1           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           G-007         G-007         0.07           GIBSON         0.04         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON         0.26           O-066         0-066	942441	AE2-257 C O1	6.04
942701         AE2-286 C         1.83           942702         AE2-286 E         2.65           942821         AE2-301 C         0.82           942822         AE2-301 E         1.24           BLUEG         0.96         0.96           CALDERWOOD         0.1         0.06           CARR         CARR         0.05           CARR         CARR         0.05           CATAWBA         0.07         0.06           CATAWBA         0.07         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         CHILHOWEE         0.03           COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4         0.0           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         0.1         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           G-8007         G-007         0.07           GIBSON         0.04         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON <t< th=""><th>942442</th><th>AE2-257 E O1</th><th>15.93</th></t<>	942442	AE2-257 E O1	15.93
942821         AE2-301 E         1.24           942822         AE2-301 E         1.24           BLUEG         0.96         O.96           CALDERWOOD         0.1         O.1           CANNELTON         0.06         O.1           CARR         CARR         0.05           CATAWBA         0.07         O.07           CHEOAH         CHILHOWEE         0.03           COFFEEN         COFFEEN         0.1           COTTONWOOD         COTTONWOOD         0.4           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         0.26         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA	942701	AE2-286 C	
942822         AE2-301 E         1.24           BUEG         BLUEG         0.96           CALDERWOOD         0.1         0.96           CARR         CARR         0.05           CARR         CARR         0.05           CATAWBA         CATAWBA         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         0.03         0.07           COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4         0.1           COTTONWOOD         0.4         0.1           COTTONWOOD         0.4         0.1           COTTONWOOD         0.4         0.22           EDWARDS         0.1         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON         0.26           O-066         0-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.	942702	AE2-286 E	2.65
BLUEG         BLUEG         0.96           CALDERWOOD         0.1         0.1           CANNELTON         0.06         0.07           CARR         CARR         0.05           CATAWBA         0.07         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         CHILHOWEE         0.03           COFFEEN         0.1         0.1           COTTONWOOD         0.4         0.1           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           GBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEELA         SANTEELA         0.03           SMITHLAND         0.04           TATANKA         TATANKA         0.12	942821	AE2-301 C	0.82
CALDERWOOD         CALDERWOOD         0.1           CANNELTON         CANNELTON         0.06           CARR         CARR         0.05           CATAWBA         CATAWBA         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         0.03         0.2           COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4         0.1           COTTONWOOD         0.4         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         TATANKA         0.12	942822	AE2-301 E	1.24
CANNELTON         CANNELTON         0.06           CARR         CARR         0.05           CATAWBA         CATAWBA         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         CHILHOWEE         0.03           COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4         0.1           COTTONWOOD         0.4         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         TATANKA         0.12	BLUEG	BLUEG	0.96
CARR         CARR         0.05           CATAWBA         CATAWBA         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         CHILHOWEE         0.03           COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4         0.2           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         0.1         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         0.26         0.06           O-066         0-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         0.12         TRIMBLE         0.11           TVA         0.34	CALDERWOOD	CALDERWOOD	0.1
CATAWBA         CATAWBA         0.07           CHEOAH         CHEOAH         0.1           CHILHOWEE         CHILHOWEE         0.03           COFFEEN         0.1         0.1           COTTONWOOD         0.4         0.1           COTTONWOOD         0.4         0.22           DUCKCREEK         0.22         0.22           EDWARDS         0.1         0.1           ELMERSMITH         0.1         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         0.26         0.05           O-066         0-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         0.04         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         0.34	CANNELTON	CANNELTON	0.06
CHEOAH         CHEOAH         0.1           CHILHOWEE         CHILHOWEE         0.03           COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4         0.2           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         0.34	CARR	CARR	0.05
CHILHOWEE         CHILHOWEE         0.03           COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4         0.4           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         0.03         SMITHLAND         0.04           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	CATAWBA	CATAWBA	0.07
COFFEEN         COFFEEN         0.1           COTTONWOOD         0.4           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         0.34	СНЕОАН	СНЕОАН	0.1
COTTONWOOD         0.4           DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         0.34	CHILHOWEE	CHILHOWEE	0.03
DUCKCREEK         DUCKCREEK         0.22           EDWARDS         EDWARDS         0.1           ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         FARMERCITY         0.07           G-007         G.07         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         NEWTON         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         0.34	COFFEEN	COFFEEN	0.1
EDWARDS         EDWARDS         0.1           ELMERSMITH         0.1         0.1           FARMERCITY         0.07         0.07           G-007         0.07         0.07           GIBSON         0.04         0.04           HAMLET         0.11         0.11           NEWTON         0.26         0.26           O-066         0-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         0.04         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         0.34	COTTONWOOD	COTTONWOOD	0.4
ELMERSMITH         ELMERSMITH         0.1           FARMERCITY         0.07         0.07           G-007         0.07         0.07           GIBSON         0.04         0.04           HAMLET         0.11         0.11           NEWTON         0.26         0.26           O-066         0-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         0.04         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	DUCKCREEK	DUCKCREEK	0.22
FARMERCITY         D.07           G-007         G-007         0.07           GIBSON         GIBSON         0.04           HAMLET         HAMLET         0.11           NEWTON         0.26         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         0.04         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         0.34	EDWARDS	EDWARDS	0.1
G-007         G-007         0.07           GIBSON         0.04         0.04           HAMLET         0.11         0.11           NEWTON         0.26         0.65           O-066         0-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	ELMERSMITH	ELMERSMITH	0.1
GIBSON         GIBSON         0.04           HAMLET         0.11         0.11           NEWTON         0.26         0.26           O-066         0-065         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	FARMERCITY	FARMERCITY	0.07
HAMLET         HAMLET         0.11           NEWTON         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	G-007	G-007	0.07
NEWTON         NEWTON         0.26           O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	GIBSON	GIBSON	0.04
O-066         O-066         0.65           PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	HAMLET	HAMLET	0.11
PRAIRIE         PRAIRIE         0.49           RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	NEWTON	NEWTON	0.26
RENSSELAER         RENSSELAER         0.04           SANTEETLA         SANTEETLA         0.03           SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	O-066	O-066	0.65
SANTEETLA         SANTEETLA         0.03           SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	PRAIRIE	PRAIRIE	0.49
SMITHLAND         SMITHLAND         0.04           TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	RENSSELAER	RENSSELAER	0.04
TATANKA         TATANKA         0.12           TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	SANTEETLA	SANTEETLA	0.03
TILTON         TILTON         0.12           TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	SMITHLAND	SMITHLAND	0.04
TRIMBLE         TRIMBLE         0.11           TVA         TVA         0.34	TATANKA	TATANKA	0.12
TVA TVA 0.34	TILTON	TILTON	0.12
	TRIMBLE	TRIMBLE	0.11
	TVA	TVA	0.34
UNIONPOWER UNIONPOWER 0.15	UNIONPOWER	UNIONPOWER	0.15

Contingency Name	Contingency Definition	
DPL_P7_1_DBL_1NCB-A	CONTINGENCY 'DPL_P7_1_DBL_1NCB-A' OPEN LINE FROM BUS 231003 TO BUS 232000 CKT 1 OPEN LINE FROM BUS 231003 TO BUS 923960 CKT 2 END	/* #1 & #2 KEENEY-STEELE 230