Transition Cycle 1, Phase 2
System Impact Study (SIS) Reports

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Interconnection Analysis

Report Type: PJM will be providing two types of SIS reports:

- Summary Report for entire TC1 Cycle
- Individual SIS Report per TC1 Project

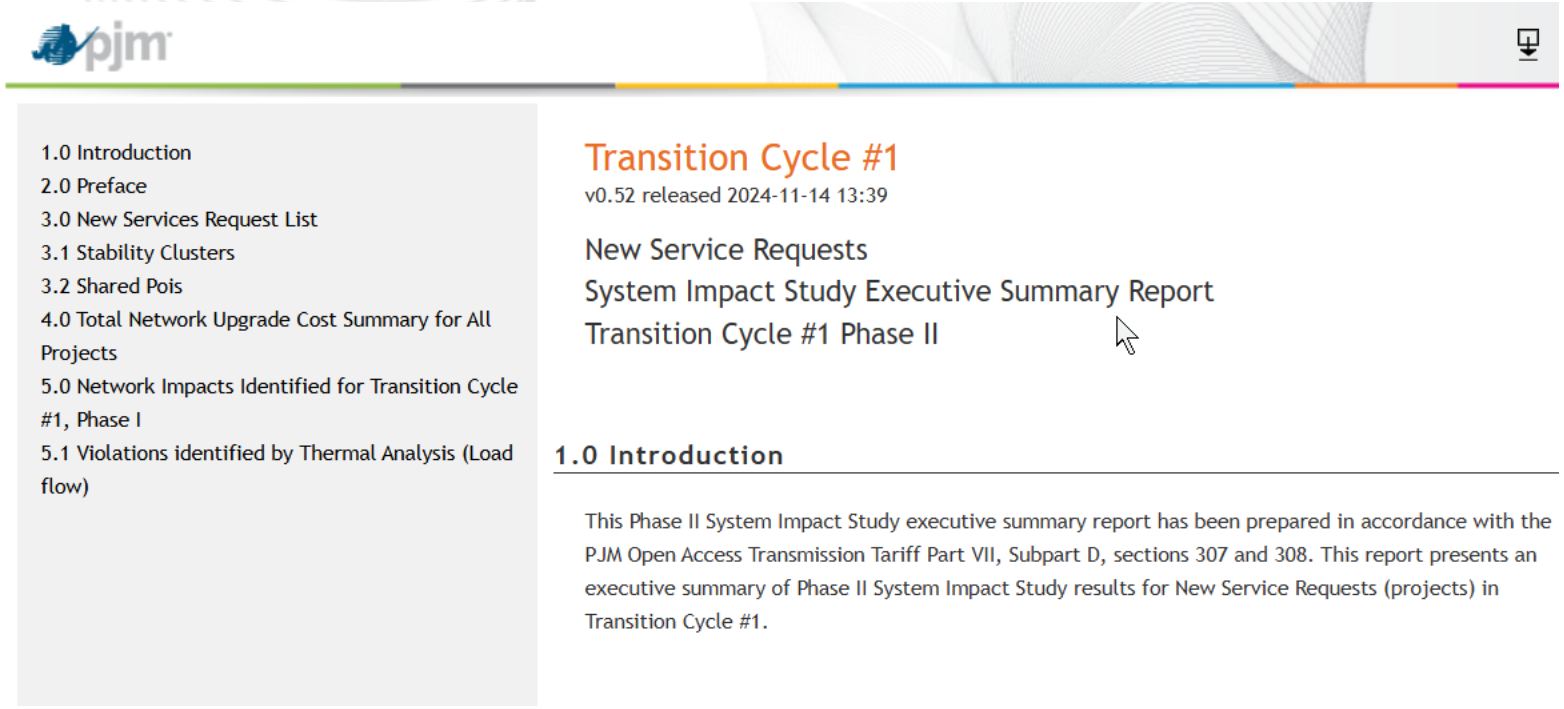
Schedule: Anticipated TC1/PH1 SIS report delivery: December 17, 2024

Website Access: SIS Reports will be made available on PJM.com for Project Developers to access.

Transition Cycle #1 Phase 2 Executive Summary Report

TC1 Phase 2 Executive Summary Report includes:

- List of all New Service Requests including high level project details
- Total Network Upgrade Cost Summary for all New Service Requests
- Network Impacts identified from the study
- Stability Clusters
- Will be posted on pjm.com



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2.0 Preface
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3.2 Shared Pois
4.0 Total Network Upgrade Cost Summary for All Projects
5.0 Network Impacts Identified for Transition Cycle #1, Phase I
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Transition Cycle #1
v0.52 released 2024-11-14 13:39

New Service Requests
System Impact Study Executive Summary Report
Transition Cycle #1 Phase II

1.0 Introduction

This Phase II System Impact Study executive summary report has been prepared in accordance with the PJM Open Access Transmission Tariff Part VII, Subpart D, sections 307 and 308. This report presents an executive summary of Phase II System Impact Study results for New Service Requests (projects) in Transition Cycle #1.

Transition Cycle #1 Phase 2 SIS Study Report

TC1 Phase 2 SIS includes:

- Detailed information for a single New Service Request
- Breakdown of Transmission Owner scope of work and costs
- Network Impacts: Analysis Results/breakdown of all overloaded flowgates
- Required Network Upgrades including costs and scope of work.
- Will be posted on pjm.com

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Short Circuit Analysis
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Steady-State Voltage Analysis
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XYZ-123 Phase 1 Study Report

v0.02 released 2024-04-15 11:46

Boardwalk 230 kV
255.5 MW Capacity / 850.0 MW Energy

Introduction

This Phase 1 System Impact Study Report (PH1) has been prepared in accordance with the PJM Open Access Transmission Tariff, Part VII, Subpart D, sections 307 and 308 for Transition Cycle #1 projects. The Project Developer/Eligible Customer (developer) is Virginia Electric & Power Company , and the Transmission Provider (TP) is PJM Interconnection, LLC (PJM). The interconnected Transmission Owner (TO) is Virginia Electric and Power Company.

Preface

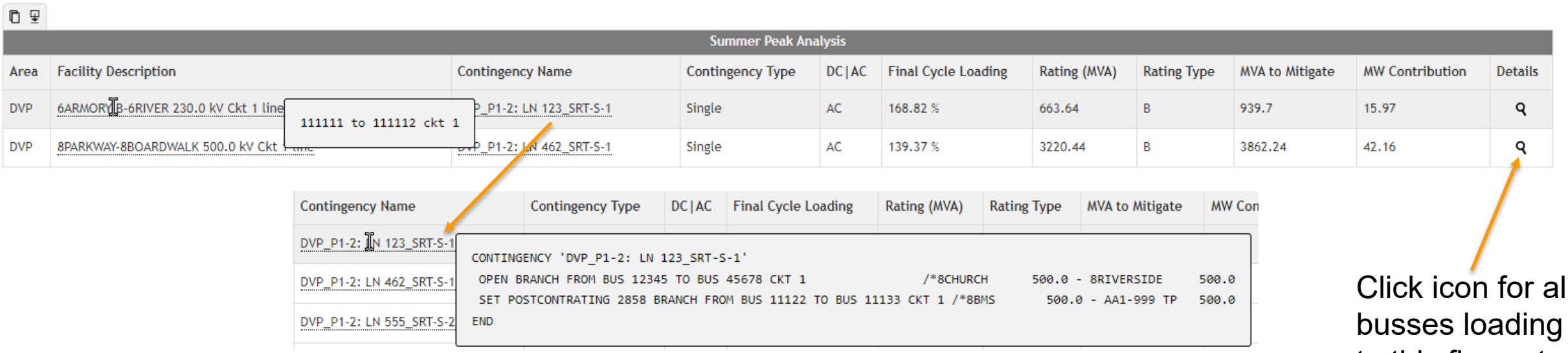
The Phase I System Impact Study is conducted on an aggregate basis within a New Services Request's Cycle, and results are provided in both (i) a single Cycle summary format and (ii) an individual project-level basis. The Phase I System Impact Study Results (for both the summary and individual reports) will be publicly available on PJM's website. Developers must obtain the results from the website.

In accordance with PJM Manual 14H, Section 4.3, PJM takes the following actions during the Phase I System Impact Study:

1. PJM studies each New Service Request on a summer peak, winter peak[1] and light load RTEP base case

Load Flow Analysis Sections

Copy Or Export CSV



Click icon for all busses loading to this flowgate

- The analysis sections show information about overloaded flowgates
- Hover over facility description to get bus numbers
- Load Flow Impacts will include the impact of topology changing reinforcement projects.

Topology Changes in Load Flow

Details for 6ELMONT-8ELMONT 230.0/500.0 kV Ckt 1 transformer l/o DVP_P4-2: H2T557_SRT-S

gy Case Flowgate

	Contingency Type	DC|AC	Final Cycle Loading	Rating (MVA)	Rating Type	MVA to Mitigate	MW Contribution	Impact of Topology Modeling
T-S	Breaker	AC	131.67	1065.0	C	1402.26	111.0	↓ Decrease

Other Possibilities

Impact of Topology Modeling	Impact of Topology Modeling	Impact of Topology Modeling
+ Addition	↑ Increase	× Elimination

- Load Flow Impacts will include the impact of toplogy changing reinforcement projects.
- Topology Changes can have a decreasing, or increasing post-cycle loading on an existing flowgate
- Topology Changes can cause an addition of a new flowgate or elimination of an existing flowgate.

Adverse Study Eligibility

Adverse Test Eligibility

This New Service Request meets the Adverse Study Impact Criteria and has the option to either move forward in the Cycle process or withdraw at DP2 with Readiness Deposits refunded. See Readiness Deposit calculation below.

This section details whether a Project Developer or Eligible Customer qualifies for the Adverse Study Impact clause outlined in the PJM OATT, Part VII, Subpart D, section 311.B and Manual 14H, section 6.2.2. In order to qualify for an Adverse Study Impact at Decision Point II, the Network Upgrade cost from Phase I to Phase II must:

1. Increase overall by 25% or more
2. Increases by more than $10,000 per MW (Includes Costs identified in Affected System studies)

If a New Service Request meets the criteria above and chooses to withdraw the request, PJM will refund the cumulative Readiness Deposit amounts paid at the Application Phase and at Decision Point I (RD1 and RD2, respectively).

$$\text{DP2 Adverse Eligibility} = \frac{\text{DP2 Adverse Cost Alloc}}{\text{DP1 Adverse Cost Alloc}} > 1.25 \quad \text{AND} \quad \frac{(\text{DP2 Adverse Cost Alloc} - \text{DP1 Adverse Cost Alloc})}{\text{Project Size}} > \$10{,}000 \text{ per MW}$$

$$\text{DP2 Adverse Eligibility} = \frac{\$2{,}169{,}850{,}181}{\$1{,}263{,}300{,}000} = 1.72 \quad \text{AND} \quad \frac{(\$2{,}169{,}850{,}181 - \$1{,}263{,}300{,}000)}{833.0} = \$1{,}088{,}296 \text{ per MW}$$

New Service Request Dependencies

New Service Request Dependencies

The New Service Request projects below are listed in one or more dispatch for the overloads identified in your report. These projects contribute to the loading of the overloaded facilities identified in your report. The percent overload of a facility and cost allocation you may have towards a particular reinforcement could vary depending on the action of other Cycle projects. The status of each project at the time of the analysis is presented in the table. This list may change as other cycle projects withdraw or modify their requests. This table is valid for load flow analyses only.

New Service Requests Dependencies

Project ID	Project Name	Status	Facility Study
AA1-139	Hickory-Shawboro 230kV	In Service	
AA1-139	Hickory-Shawboro 230kV	In Service	
AA1-139	Hickory-Shawboro 230kV	In Service	
AA1-139	Hickory-Shawboro 230kV	In Service	

- This section contains a list of other New Service Requests which share in the loading of an overloaded facility in your report.
- Changes made to these projects could impact your load flow analysis results and / or cost allocation for a particular network upgrade reinforcement.

System Reinforcements Sections

System Reinforcements for TC1 will be categorized by which analysis identified the requirement (Load Flow, Short Circuit, Stability, etc.)

System Reinforcement			
RTEP ID	Title	Total Cost	Time Estimate
n55512	Add additional 138/115 kV transformer at American Legion substation	$6,000,000	16 - 18 Months

Contributor

Description: Add additional 138/115 kV transformer at American Legion substation

Flowgates Addressed by this Reinforcement	
Facility	Contingency
3LEGION-4LEGION 115.0/138.0 kV Ckt 1 transformer	(Any)
3LEGION-4LEGION 115.0/138.0 kV Ckt 2 transformer	(Any)

New Ratings			
Facility	Rating Set	Rating Type	Rating Value
3LEGION-4LEGION 115.0/138.0 kV Ckt 1 transformer	(All)	A	140 MVA
3LEGION-4LEGION 115.0/138.0 kV Ckt 1 transformer	(All)	B	140.8 MVA
3LEGION-4LEGION 115.0/138.0 kV Ckt 1 transformer	(All)	C	146 MVA

Cost Allocation			
Project	MW Impact	Percent Allocation	Allocated Cost ($USD)
XYY-123	15.6 MW	9.5%	$569,356
XYY-124	15.6 MW	9.5%	$569,722
XYZ-123	17.2 MW	10.5%	$627,499
XYZ-124	17.2 MW	10.5%	$627,499
XYZ-125	17.2 MW	10.5%	$627,499
XYZ-403	10.6 MW	6.4%	$386,153
XYZ-404	10.6 MW	6.4%	$386,153
XYZ-539	60.3 MW	36.8%	$2,206,119

Notable Change in Cost Allocation Process: New Service Requests which share a common POI will be considered together in aggregate for cost allocation. The projects which are grouped together will be distinguished in the cost allocation table

Readiness Deposit

Readiness Deposit #3 calculations will be shown on the Individual SIS Report. This will be 20% of the cost allocated for your project less the sum of RD1 + RD2.

The Readiness Deposit must be provided at DP2 through wire transfer ore letter of credit per Manual 14H, Section 6.2.

Readiness Deposit

Per Tariff Part VII, Subpart D, section 311 (Decision Point II) A.1.b and PJM Manual 14H, section 6.2, Readiness Deposit #3 (RD2) are funds committed by the Project Developer or Eligible Customer based upon the applicable contribution to Network Upgrades as defined below and not used to fund studies nor to offset Security.

During Decision Point II (DP2), the Project Developer or Eligible Customer is required to submit Readiness Deposit #3, which is calculated as 20% of cost allocation for required Phase II Network Upgrades minus Readiness Deposit #1 & Readiness Deposit #2.

Note 1: "Network Upgrades" referred to in the calculation include both (i) the Physical Interconnection Network Upgrades and (ii) the System Reliability Network Upgrades as shown in the Cost Summary table.

Note 2: Readiness Deposit #1 (RD1) = ($4,000 * Project Size (MW))

Note 3: Readiness Deposit #2 (RD2) = 10% of cost allocation for required Network Upgrades minus RD1. Readiness Deposit #2 (RD2) can be zero, but may not be a negative number.

Note 4: Readiness Deposit #3 can be zero, but may not be a negative number.

Readiness Deposit #3 Due for Project ZZ1-555

Readiness Deposit #3 has been calculated for the ZZ1-555 project based on the Phase II System Impact Study results and is shown in the table below. This Readiness Deposit #3 must be provided at Decision Point II through either a wire transfer or letter of credit per Manual 14H, Section 6.2.

Readiness Deposit			
Project ID	20% of cost allocation for Phase II Network Upgrades	Sum of Readiness Deposit #1 & Readiness Deposit #2 Received (RD1+RD2)	Readiness Deposit #3 (RD3) for ZZ1-555 Project due at DP2
	A	B	A - B
ZZ1-555	$126,330,000	$3,520,000	$25,982,549

Note: Failure to provide an acceptable form of Readiness Deposit #3 by the end of Decision Point II will result in withdrawal and termination of the New Service Request.

For additional detail regarding Readiness Deposit Refunds, reference PJM Manual 14H, section 6.2.1. The Readiness Deposit Letter of Credit template can be found here.

Other Impacts

Impacts for Short Circuit, Stability, Affected Systems, and other Special Studies will be included in the Phase 2 SIS Report.

Short Circuit Example:

Short Circuit Analysis

Short Circuit Results						
Bus #	Bus Name	Breaker	Type	Rating	Duty % Post b5555.8	Duty % Pre b5555.8
12345	EAGLES 230.kV	*55555-3*	S	*40,000*	*109.54%*	*83.10%*
67890	EAGLES 230.kV	*555T002*	S	*40,000*	*105.32%*	*77.28%*
23456	EAGLES 230.kV	*55544*	S	*40,000*	*100.80%*	*74.57%*
34567	BIRDS 230.kV	*55512*	S	*40,000*	*101.26%*	*99.11%*
45678	BIRDS 230.kV	*555T554*	S	*40,000*	*100.45%*	*98.29%*

Queue Projects related to B3694.7:
- Fast Lane are ZZ1-553, ZZ1-554, ZZ1-555, ZZ1-556;
- TC-1 projects: ZZ1-601, ZZ1-602, ZZ1-603, ZZ1-604

The following load flow reinforcement was tested for short circuit: b5555.8- Energize in-service spare 500/230 kV Eagles Tx1. The reinforcement was tested at the ZZ1-555 queue position (the driver project for this violation), and the following breakers are overduty as a result of the network upgrade. Any queue project relying on b5555.8 will receive cost allocation towards replacing these circuit breakers if it meets cost allocation rules.

Short Circuit Cost Allocation					
Violation #	Breaker	Description	Upgrade ID	Total Cost	Allocated Cost
2	Eagles 230kV 55555-3	Replace the Eagles 230kV 55555-3 circuit breaker with a 50kA device Queue Project ZZ1-555 presently does not receive cost allocation for this upgrade. See Note 1 and Note 2 at bottom of this table.	N55555.2	$458,693	$0

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