

Queue Scope Tool Update

Geospatial Application

Leo Amoling
Interconnection Planning Analysis
Interconnection Process Subcommittee
October 30th, 2023

Official Tool Name: **Queue Scope**

DESCRIPTION: The screening tool enables users to evaluate placement of future generators even before formally entering the PJM queue. The tool screens potential points of interconnection (POI) on the PJM system by assessing grid impacts based on the amount of MW injection or withdrawal at a given POI.

Tool Functionality

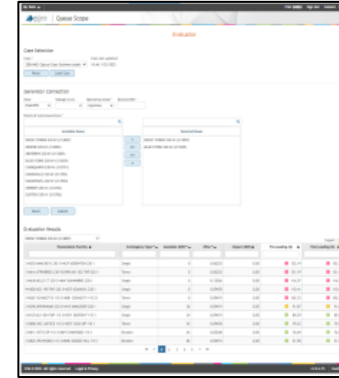
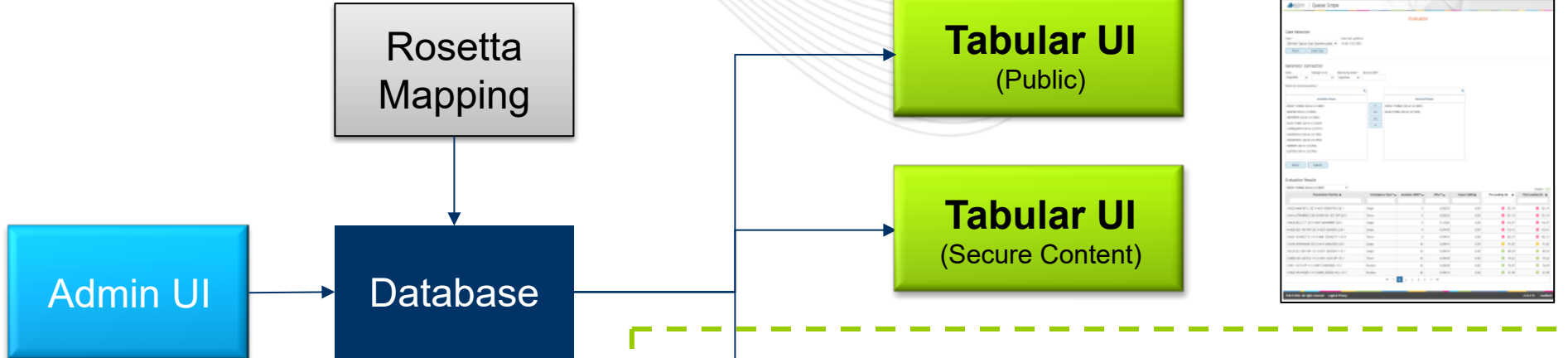
- Capabilities**
- Provides the ability to assess all types of generation (including batteries, pumped hydro, MTX)
 - Leverages stored results from PJM generator deliverability analysis
 - Provides facility loading impacts and headroom (MW) by POI
 - 6000+ POI buses available to users within the PJM footprint
 - Users have the option to run the analysis with a Transmission Planning case or Queue Study case

- Limitations**
- No short circuit, voltage or stability analysis. Thermal overloads are the typical constraint.
 - Currently limited to Summer Peak analysis. Future plans to include Light Load analysis.

- **Phase 1 – Tabular User Interface (COMPLETE)**
 - This phase of the project included database & application development
 - Application go-live in production was in Dec 2022
 - Tool is accessible from the Planning Center Tools page on PJM.com

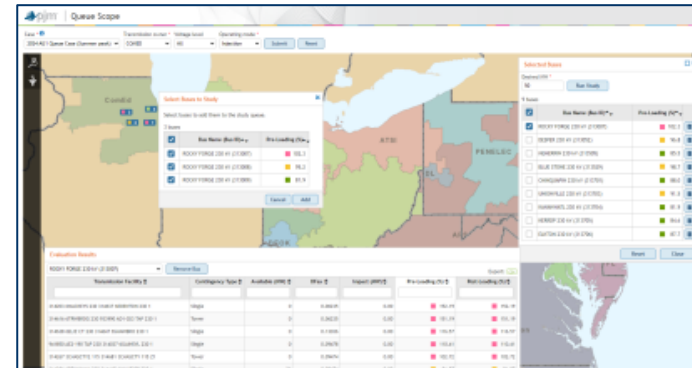
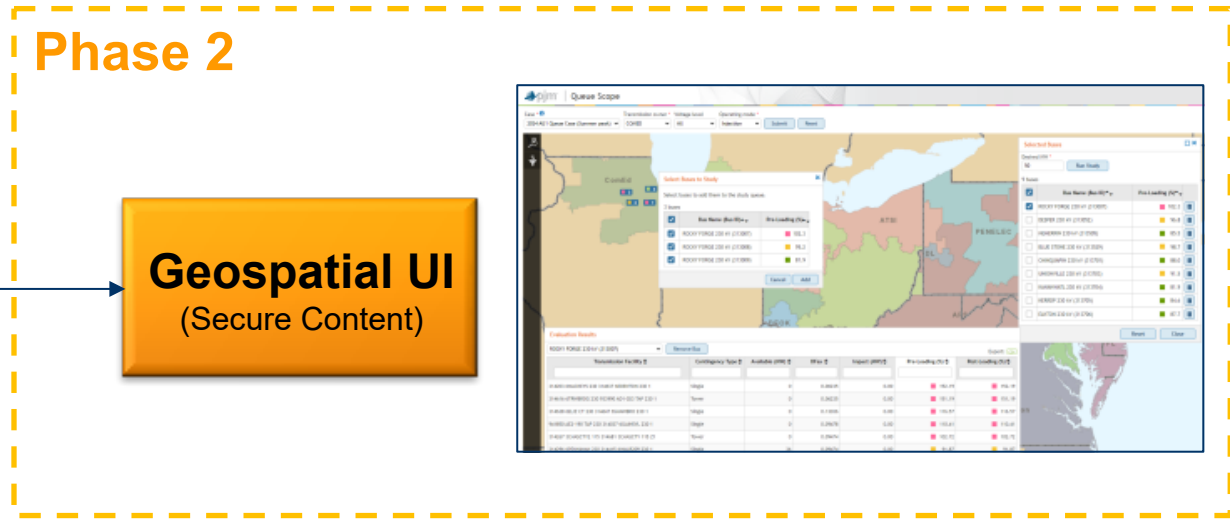
- **Phase 2 – Geospatial User Interface (IN-PROGRESS)**
 - Targeting for a Dec 2023 go-live in production (pending final testing)
 - Will leverage similar capabilities/feel of the existing PJM system map along with Tabular App workflow
 - Provides users with visual cueing for grid congestion
 - Tool will be accessible from the Planning Center Tools page on PJM.com just like the Tabular App
 - Now a requirement under FERC Order 2023

Phase 1

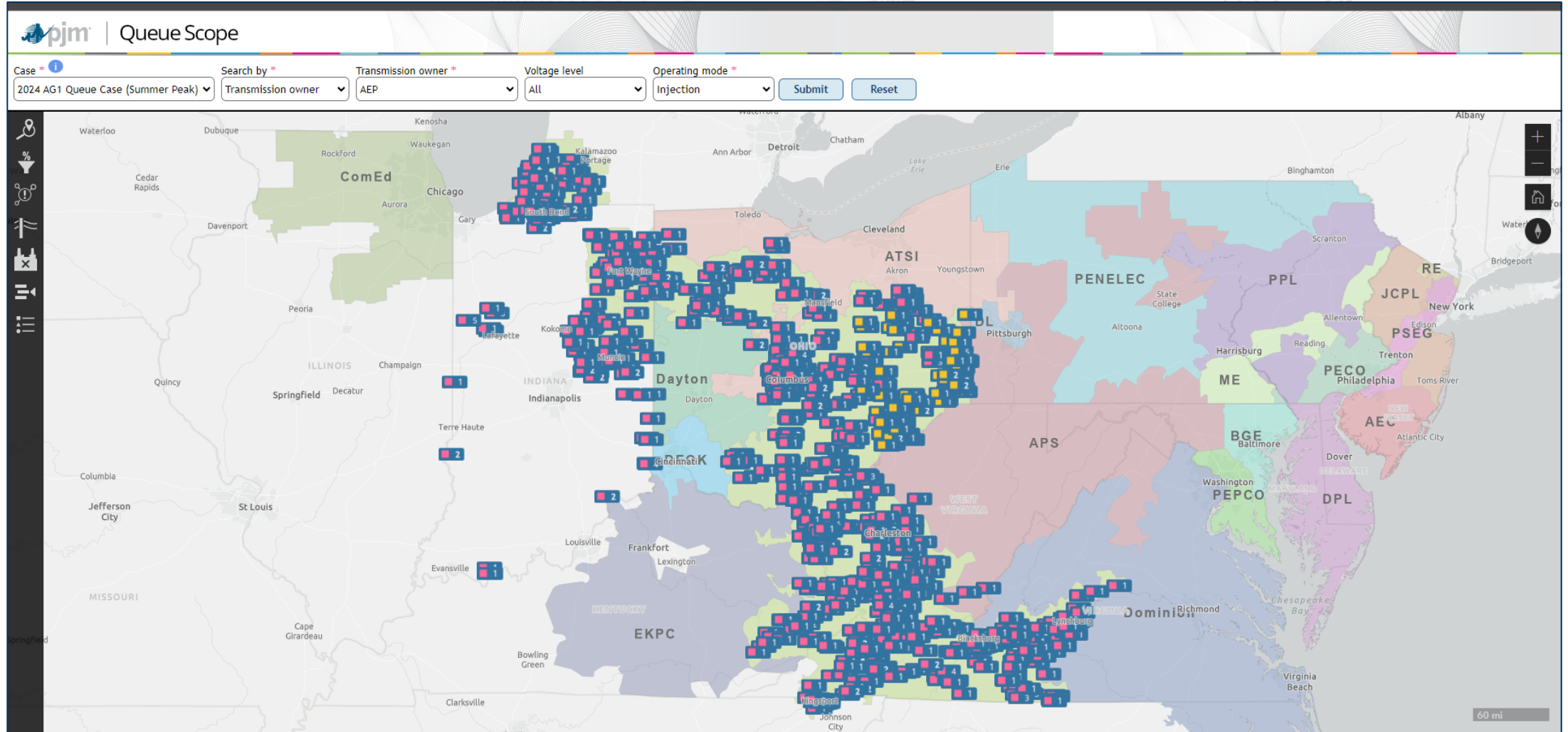


2022

Phase 2



2023



Presenter:

Leo Amoling, Sr. Engineer
Interconnection Planning Analysis

Leo.Amoling@pjm.com



Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com

Back-Up Slides

| Queue Scope

Case * Search by * Transmission owner * Voltage level Operating mode *

Select a Case to Start the Workflow

Select Search by TO or Bus Name/Bus Number to update workflow fields

Map labels include: Madison, Milwaukee, Grand Rapids, Flint, Sarnia, London, Brantford, Catharines, Rochester, Buffalo, Lansing, Waterford, Detroit, Chatham, Erie, Toledo, Cleveland, ATSI, Youngstown, PENELEC, State College, Harrisburg, ME, Dayton, Columbus, OHIO, DL Pittsburgh, Altoona, BGE Baltimore, PEPCO, Washington, WEST VIRGINIA, Charleston, APS, Mansfield, Fort Wayne, Muncie, Kokomo, Lafayette, Indianapolis, Indiana, Terre Haute, Peoria, Champaign, Springfield, Decatur, ILLINOIS, Aurora, Gary, South Bend, Waukegan, Kenosha, Racine, Chicago, ComEd, Davenport, Peoria, Quincy, St Louis, Louisville, Frankfort.

The screenshot displays the Queue Scope Geospatial App interface. At the top left, the PJM logo and the text "Queue Scope" are visible. Below this, there are several filter controls: "Case *" with a dropdown menu showing "2024 AG1 Queue Case (Summer Peak)", "Search by *" with a dropdown menu showing "Transmission owner", "Transmission owner *" with a dropdown menu showing "Select a Transmission Owner", "Voltage level" with a dropdown menu, and "Operating mode *" with a dropdown menu showing "Injection". There are "Submit" and "Reset" buttons to the right of the filters. Below the filters is a map of the Midwest region, showing various cities and transmission areas. A red box highlights the "Search by" dropdown menu. A red callout box points to the "Voltage level" dropdown menu with the text: "Once TO is selected, the voltages are populated for selection. Default is 'All'". Another red callout box points to the "Transmission owner" dropdown menu with the text: "TO List will populate once case is selected and Transmission owner is selected in Search by feature". The "Transmission owner" dropdown menu is open, showing a list of transmission owners: AE, AEP, AP, ATSI, BGE, CE, DAY, DEO&K, DLCO, DP&L, DVP, EKPC, JCPL, METED, OVEC, PECO, PENELEC, PEPCO, and PJM.

Case 2024 AG1 Queue Case (Summer Peak) | **Search by** Transmission owner | **Transmission owner** AP | **Voltage level** All | **Operating mode** Injection | Submit | Reset

Select Buses to Study

Select buses to add them to the study queue.

<input type="checkbox"/>	Bus Name (Bus #)	Pre-Loading (%)
<input checked="" type="checkbox"/>	0 POTTER 115 KV (235234)	181.5

Add

Zoom to

Substation Name	POTTER
Transmission Owner	AP
Number of Buses	1

Annotations:

- Once workflow is complete and Submit is selected, all of the substation symbols in the TO footprint will load.
- Once the substation is selected in the map, the user has the ability to select POI buses and add them to a study
- This is a hover pop-up for the substation symbol

ing mode *

on

Submit Reset

Zoom to

Substation Name	POTTER
Transmission Owner	AP
Number of Buses	1

Selected Buses

Desired MW *

100

Run Study

<input type="checkbox"/>	Bus Name (Bus #)	Pre-Loading (%)	
<input checked="" type="checkbox"/>	01POTTER 115 KV (235234)	181.5	

Reset

Evaluation Results 🔍 - ↗ ✕

Ability to select different POIs run in the study
Same Results Table Presented in Tabular App
Export

Transmission Facility	Contingency Name	Contingency Type	Rating	Available (MW)	DFax	Impact (MW)	Impact (%)	Pre-Loading (%)	Post-Loading (%)
		All ▾							
966040 AG1-473 TAP 230 200513 26LEWISTWN 230 1	Base Case	Operational	520	0	0.104	10.4	2	■ 190.76	■ 192.76
235248 01SHINGL 230 966040 AG1-473 TAP 230 1	Base Case	Operational	520	0	0.104	10.4	2	■ 184.1	■ 186.1
235203 01KISSNG 138 235197 01KARNSC 138 1	ATSI-P2-3-CEI-345-004D	Breaker	268	0	0.063	6.3	2.35	■ 181.52	■ 183.87
235203 01KISSNG 138 235197 01KARNSC 138 1	PN-P1-2-PN-345-107T	Operational	268	0	0.065	6.5	2.43	■ 180.75	■ 183.18
966040 AG1-473 TAP 230 200513 26LEWISTWN 230 1	AP-P2-2-WP-230-001T	Bus	621	0	0.067	6.7	1.08	■ 173.41	■ 174.49
966040 AG1-473 TAP 230 200513 26LEWISTWN 230 1	PN-P2-3-PN-115-59B_A	Breaker	621	0	0.115	11.5	1.85	■ 173.1	■ 174.95
966040 AG1-473 TAP 230 200513 26LEWISTWN 230 1	PN-P1-2-PN-230-020A	Operational	621	0	0.107	10.7	1.72	■ 167.32	■ 169.04
235248 01SHINGL 230 966040 AG1-473 TAP 230 1	AP-P2-3-WP-230-446T	Breaker	621	0	0.067	6.7	1.08	■ 167.3	■ 168.38

Case * i Search by * Transmission owner Select

Navigate to Coordina... x

Ex. 40.71,-74.006

Submit

Search by Lat/Long using decimal coordinate format

Case * i Search by * Transmission owner Select

Pre-Loading Status F... x

Status

- 100%+
- 90-100%
- 0-90%

Custom

From 0 To 100 %

Reset

Pre-Loading Status Filter is used to filter POIs presneted in the map

Case * i Search by * Transmission owner Select

Congestion Overlay x

Show Pre-Load Overlay

Loading Percentage

0 175+

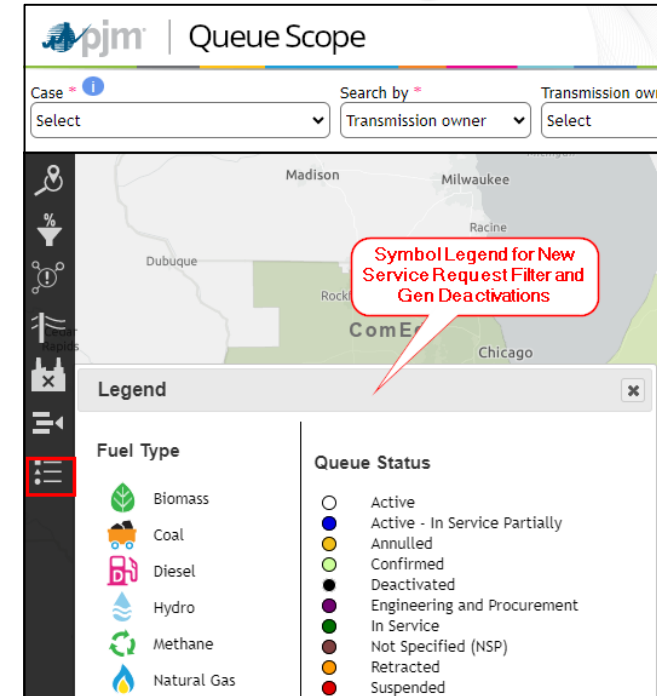
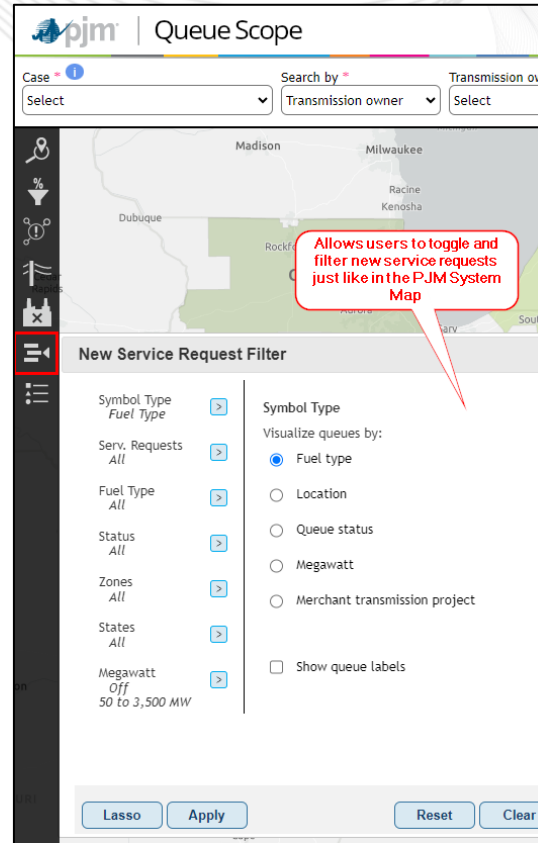
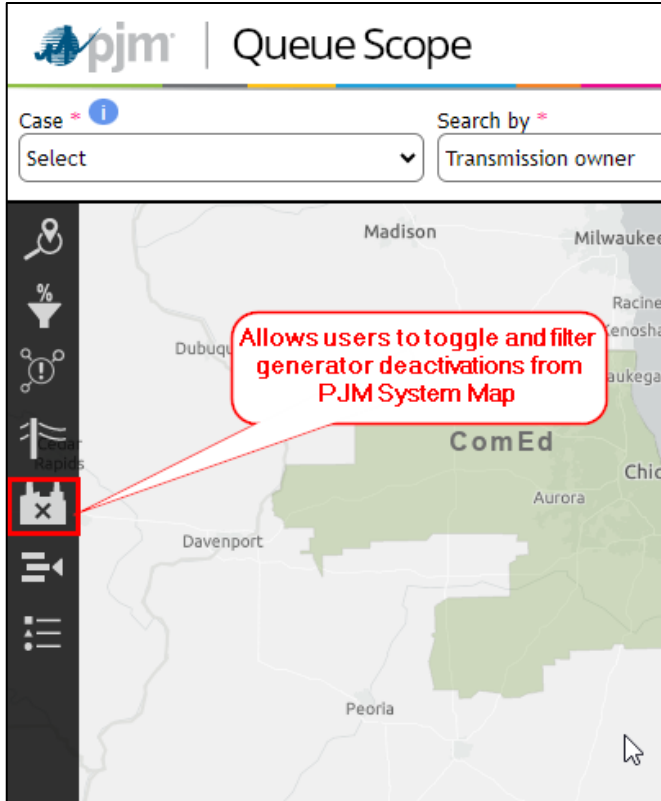
Congestion Overlay control allows user to turn ON & OFF. Also provides color gradient for POI pre-loading (%)

Case * i Search by * Transmissi Select

kV Filter x

- All
- 69
- 115
- 120
- 138
- 161
- 230
- 345
- 500
- 765
- HVDC

Allows users to toggle transmission lines in the map



Case ¹ 2025 RTEP Base Case (Summer Peak) Search by * Transmission owner * AEP Voltage level All Operating mode * Injection Submit Reset

