



Queue Scope User Guide

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For Public Use

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Disclaimer Notice

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Introduction

Queue Scope enables users to evaluate the placement of future generators before formally entering the PJM interconnection process. The tool screens potential points of interconnection (POI) on the PJM system by assessing grid impacts based on the amount of megawatt injection or withdrawal at a given POI.

Queue Scope is an informational tool and is not intended to be a substitute for actual interconnection studies conducted by PJM as part of PJM's interconnection process. Queue Scope results are not reflective of current PJM system conditions and may not account for all study assumptions and considerations that would otherwise be considered in the formal interconnection study process.

Queue Scope may help users determine where thermal grid impacts exist or where transmission headroom may exist for a potential generator interconnection at different POI areas across the PJM footprint. The data sets leveraged in the tool are created using a high-level DC flowgate screening across the PJM area. The DC flowgate screening is performed using the PJM TARA Generator Deliverability Tool developed by PowerGem.

Queue Scope uses the following two input case types and related contingency files:

- **RTEP base case**
Uses the RTEP base case from Transmission Planning, which only contains existing generators and queue/cycle projects with a signed interconnection agreement (high commercial probability projects).
- **Queue/Cycle study case**
Uses the Queue/Cycle study case from Interconnection Analysis, which contains all active queue/cycle projects (mix of high and low commercial probability projects).

Queue Scope is available as two applications:

- **Tabular Application**
 - **Public Version:** No user login required; some data fields are restricted; does not have the ability to download results.
 - **Secure Version:** User login required through Account Manager; some data fields are restricted; results can be downloaded.
 - **Secure Version + CEII Data:** User login required; additional data fields are provisioned to the user (CEII access must be approved to view this version through Customer Account Manager).
- **Geospatial Application**
 - **Secure Version:** User login required through Account Manager; some data fields are restricted as seen in the Tabular Application.
 - **Secure Version + CEII Data:** User login required; additional data fields are provisioned to the user (CEII access must be approved to view this version through Customer Account Manager).

This guide provides an overview on how to use both applications and the features that are unique to each.

Section 1: Access Request for Queue Scope

The public version of Queue Scope's tabular application does not require any special access approval or login through Account Manager. In order to access the versions of Queue Scope's tabular and geospatial applications with secure or secure + CEII data, follow the steps below to set up or update your account in Account Manager. The tabular and geospatial applications share the same roles in Account Manager.

If your company is an active member of PJM:

1. Go to PJM's [Account Manager page](#)
2. Log in to Account Manager with your user ID and password and request **Queue Scope Read Only**.
3. If you do not see **Queue Scope Read Only**, request access through your company Account Manager (CAM). They will be able to authorize your access to the **Queue Scope Read Only** role. You may be required to create a new user ID under the specific organization provided by your CAM.

If your CAM administrator is not familiar with **Queue Scope Read Only**, please contact custsvc@pjm.com.

If your company is not an active Member and/or you do not have an account, please visit the [Account Manager page](#) for further guidance on Non-Member CAMs and Non-member accounts. For any additional questions and guidance, please contact custsvc@pjm.com.

Queue Scope CEII Data Access Request

Once approved, the Queue Scope CEII data request enables a user to view additional data fields such as the contingency description and the facility ratings in the study results of the tool. The CEII Request Process is as follows:

1. User must have a PJM.com account and already have **Queue Scope Read Only** provisioned before starting the CEII data request process. **Do not request the CEII data before requesting application access.**
2. Go to Library and fill out the [form](#) to request CEII access.
3. Fill out the form and put **Queue Scope** in the "Description of CEII Materials" box. Fill out the rest of the form and click Submit.
4. Submit the PJMCEII Non-Disclosure Agreement (NDA) if not completed previously.

After submitting the CEII request, users can expect the following:

1. Once the CEII secure area request goes through the workflow within PJM.com, it is automatically sent to the PJM CEII Admin for final approval.
2. Once approved, the user will be notified via email that access has been granted to the **My PJM Queue Scope CEII Data** secure area.
3. The user will now be able to view the additional CEII data fields when using the Account Manager Login for the Queue Scope secure access.

Section 2: Queue Scope Capabilities (Tabular & Geospatial)

With Queue Scope, users are able to assess injection and withdrawal operating modes.

Note: *Withdrawal modes apply to projects with a load component, such as battery charging from the grid, pumped hydro, Merchant Transmission Projects –MTX, etc.*

Queue Scope has the following capabilities in order to make these assessments:

- Queue Scope provides results based on the DC flowgate screening results from PJM's TARA Generator Deliverability Tool and provides flowgate (mon/con pair) loading with pre-/post-loading and megawatt headroom by POI.
- Users can assess over 6,000 POI buses within the PJM footprint.
- Users can select different case types (RTEP vs. Queue/Cycle) and different case years to compare results.
- Users can enter up to 9,999 MW of injection or withdrawal at a time per POI. (**Note:** Only positive megawatt values need to be entered for a withdrawal scenario, as the tool automatically calculates based on the selected operating mode.)
- Users can run an evaluation and export the results to an Excel file on up to 25 POI buses at a given time.
- The geospatial application allows users to locate POI buses via three methods: navigate to coordinates, search by transmission owner, and search by bus name/bus number.
- The geospatial application allows users to overlay transmission lines, new service requests, and generator deactivations within the map while reviewing POIs and running a generator evaluation.
- The geospatial application also includes a congestion overlay for the entire PJM footprint, which provides insight into the facility overloads by POI based on generation under study within the case. This overlay provides a visual representation of transmission headroom or the severity of facility overloads based on generation under study in the case. (**Note:** This overlay is not related to market-based congestion terminology and is similar in nature to what many call a “heat map” of the facility loading impacts by POI bus.)

Section 3: Queue Scope Limitations (Tabular & Geospatial)

Queue Scope has the following limitations and/or base assumptions for the analysis:

- Queue Scope is not capable of performing “On Demand” analysis (no TARA/PSSE software is running in the background).
- Datasets are generated using a linear DC flowgate analysis to estimate impacts and are **not** based on an AC solution. Queue Scope only provides a linear estimation of grid impacts and not a final AC solution used in impact studies to determine any required upgrades and the associated cost allocation.
- Transmission headroom calculation (Available MW) is only for thermal or steady-state load flow analysis.
- Results do not include any system impacts from voltage, short circuit or stability analysis.
- Project loaders in a flowgate are not provided with a megawatt contribution breakdown or flowgate loading breakdown. The assessment is only based on the desired MW value entered in the tool.

- Individual project impact reports are not generated by this tool or available for review.
- Reinforcement cost estimates or cost allocation for a flowgate overload is not provided.
- In a Queue/Cycle study case, reinforcements related to active projects are not built into the study case. This may result in low or no facility headroom since the reinforcement isn't modeled.
- POI selection is limited to existing POI buses within the PJM system/model, which correspond to existing transmission facilities/substations.
- Users cannot create new buses (POIs) using the tool or add tap buses to existing lines. The results from two desired POIs can, on either end of a branch, be used to provide a close estimate of grid impacts.
- POI bus selection is limited to 100 kV and above.
- Queue Scope is currently limited to summer peak analysis. Future enhancements will eventually incorporate light load analysis and winter peak analysis as applicable.
- Pre-contingency facility ratings may not have been applied for a small subset of monitored facilities in the results.
- Queue Scope assumes 100% commercial probability of the all the units modeled in the case.

Section 4: PJM Transmission Owner Abbreviations

Queue Scope lists Transmission Owner zones as abbreviations. Please use the following table as a reference for what these abbreviations mean in Queue Scope.

| Abbreviation | Definition |
|--------------|---|
| AE | Atlantic City Electric Exelon |
| AEP | American Electric Power |
| AP or APS | Allegheny Power FirstEnergy |
| ATSI | American Transmission Systems, Inc. FirstEnergy |
| BGE | Baltimore Gas & Electric Exelon |
| CE | Commonwealth Edison Company (ComEd) Exelon |
| DAY | Dayton Power and Light (Now AES Ohio) |
| DEO&K | Duke Energy Ohio/Kentucky |
| DP&L | Delmarva Power & Light Exelon |
| DLCO | Duquesne Light Company |
| DVP | Dominion Virginia Power |
| EKPC | Eastern Kentucky Power Cooperative Inc. |
| JCPL | Jersey Central Power & Light FirstEnergy |
| ME or METED | Metropolitan Edison Company FirstEnergy |
| OVEC | Ohio Valley Electric Corporation |
| PECO | PECO Energy Company Exelon |
| PENELEC | Pennsylvania Electric Company FirstEnergy |
| PEPCO | Potomac Electric Power Company Exelon |
| PL | PPL Electric Utilities Corporation |
| PSEG | Public Service Electric & Gas Company |
| PJM | Mid-Atlantic Area Council 500kV transmission backbone area buses only |
| RECO | Rockland Electric (East) |
| SMECO | Southern Maryland Electric Cooperative |
| UGI | UGI Utilities, Inc. |

Section 5: Tabular Application Overview & Workflow

Display Overview

Queue Scope's tabular application displays transmission availability on the grid based on a user-defined generator at various locations across the PJM transmission system.

When first accessing Queue Scope, a user will be prompted to accept terms of use and acknowledge the PJM legal disclaimer before using the tool as shown in **Figure 5.1**.

Users can select inputs such as the case years/type, transmission owner area, voltage level, operating mode, desired megawatt amount, and the generation/storage POI as shown in **Figure 5.2**. After clicking the Submit button, the application runs the analysis and generates the evaluation results as shown in **Figure 5.3**. The results contain the list of flowgate facilities, contingency type, available megawatts, distribution factor (related to the selected POI bus), impact megawatts, pre-loading level and post-loading level.

Figure 5.1. Disclaimer Acknowledgment

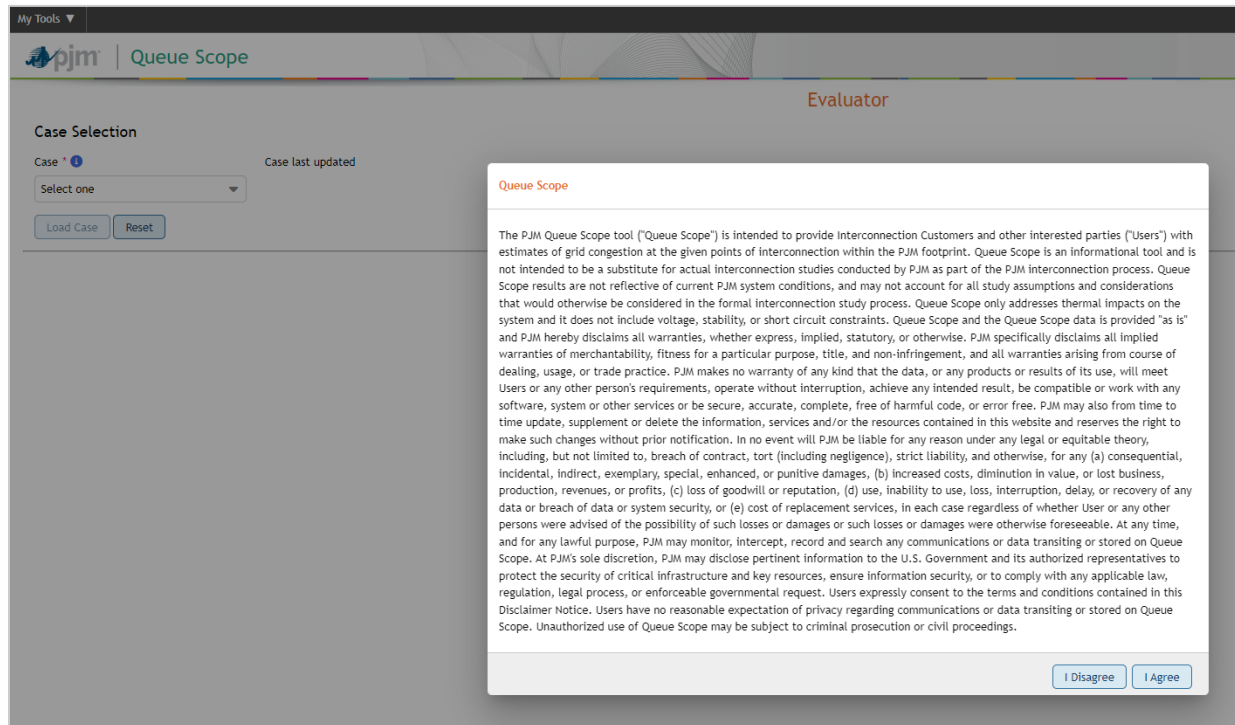


Figure 5.2. User Inputs

Queue Scope
Evaluator

Case Selection

Case * i

2025 RTEP Base Case (Summer Peak)
▼

Case last updated

11/18/2022 14:22

Load Case

Reset

Generator Connection

Transmission owner *

AE
▼

Voltage level

138 kV
▼

Operating mode *

Injection
▼

Desired MW *

1

Points of interconnection * Maximum: 25

Available Buses

- CARDIFF 138 kV (227913)
- CARDIFF2 138 kV (227934)
- CHURCHTN 138 kV (228314)
- CORSON 1 138 kV (228106)
- CORSON 2 138 kV (228107)
- CORSON 3 138 kV (228108)
- CUMB 138 kV (228262)
- DENNIS 138 kV (228216)
- DOROTHY 138 kV (227901)
- FRANKLIN 138 kV (228482)

◀◀
<
1-10 of 32 records
>
▶▶

>

>>

<

<<

Selected Buses

BLE 138 kV (228110)

◀◀
<
1-1 of 1 records
>
▶▶

Submit

Reset

Figure 5.3. Output Results

Evaluation Results
Export: XLS

BLE 138 kV (228110)
▼

| Transmission Facility | Contingency Type | Available (MW) | Dfax | Impact (MW) | Pre-Loading (%) | Post-Loading (%) |
|---|------------------|----------------|-------|-------------|-----------------|------------------|
| 218343 TOSCO_2 230 218441 VFT_2 230 1 | Tower | 0 | 0.021 | 0.02 | 100.04 | 100.04 |
| 218300 LINDEN 230 219046 TOSCO_3 230 1 | Tower | 7 | 0.022 | 0.02 | 99.37 | 99.37 |
| 204693 27BOONETOWN 230 204512 275.RDG 230 1 | Bus | 90 | 0.020 | 0.02 | 82.98 | 82.98 |
| 218345 ALDENE_6 230 216911 SPRINGRD_3 230 1 | Bus | 121 | 0.020 | 0.02 | 82.75 | 82.75 |
| 218345 ALDENE_6 230 216911 SPRINGRD_3 230 1 | Breaker | 125 | 0.020 | 0.02 | 82.16 | 82.16 |
| 218345 ALDENE_6 230 216911 SPRINGRD_3 230 1 | Single | 140 | 0.020 | 0.02 | 80.04 | 80.04 |
| 200066 PCHETMIN 500 270072 FUR RUN_500 500 1 | Breaker | 919 | 0.288 | 0.29 | 74.53 | 74.54 |
| 213489 CHICHTS1 230 213588 EDOYSTN4 230 1 | Single | 288 | 0.035 | 0.04 | 73.32 | 73.32 |
| 213489 CHICHTS1 230 213588 EDOYSTN4 230 1 | Breaker | 299 | 0.025 | 0.03 | 72.27 | 72.27 |
| 200066 PCHETMIN 500 270072 FUR RUN_500 500 1 | Single | 1034 | 0.291 | 0.29 | 71.36 | 71.37 |
| 219100 HEWFRDM 230 219704 HILLTOP_4 230 1 | Tower | 218 | 0.109 | 0.11 | 70.57 | 70.58 |
| 200021 SUNBURY 500 200009 JUNIATA 500 1 | Single | 968 | 0.048 | 0.05 | 68.88 | 68.88 |
| 200064 PCHETM15 500 200004 CNASTONE 500 1 | Single | 1158 | 0.342 | 0.34 | 68.00 | 68.01 |
| 219100 HEWFRDM 230 219704 HILLTOP_4 230 1 | Single | 238 | 0.084 | 0.08 | 67.82 | 67.83 |
| 270072 FUR RUN_500 500 270073 FUR RUN_230 230 1 | Single | 404 | 0.100 | 0.10 | 67.61 | 67.62 |

Records Per Page: 15
◀◀
<
1-15 of 426 records
>
▶▶

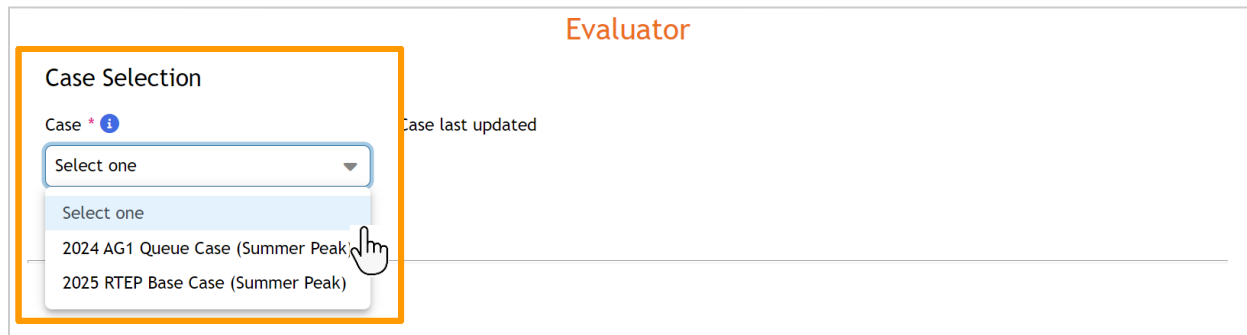
How To Use the Tool: General Walk-Through

This section contains the general steps on how to use the Tabular Application to run POI evaluations.

1. Case Selection

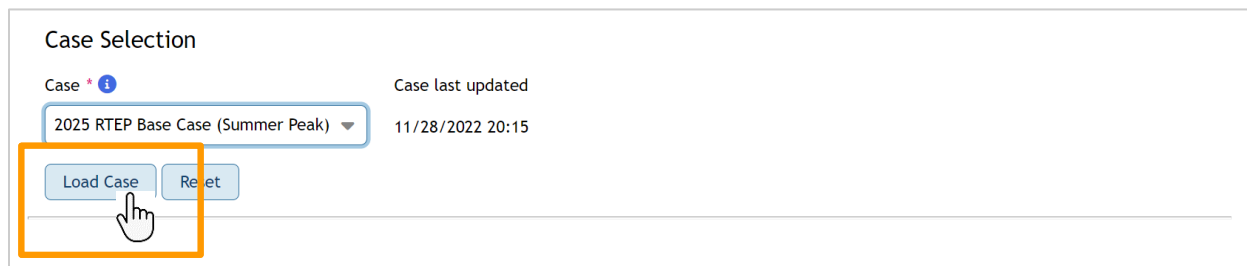
First, select a case, which corresponds to the case study results stored in a database. This can be a case used for Queue/Cycles labeled as the Queue or Cycle case or the yearly PJM Planning base case labeled as the RTEP base case. (This includes generation with executed interconnection agreements.)

Select the desired **case** from the drop-down list shown below.



2. Load Case

After making the case selection, click on **Load Case** as shown below. The case's last updated time stamp will be shown, which is the date when PJM last updated the case study results in the database. These files are static outputs/results files generated from the PowerGem TARA GD tool.



3. Generator Connection Details

After loading the case results, the tool provides a prompt with generator-related selections and inputs, such as Transmission Owner area, voltage level, operating mode and desired megawatts. Choose available POIs to further evaluate based on these input parameters.

Evaluator

Case Selection

Case * i Case last updated

2025 RTEP Base Case (Summer Peak) 11/28/2022 20:15

Generator Connection

Transmission owner * Voltage level Operating mode * Desired MW *

Select one All Injection

Points of interconnection * Maximum: 25

Available Buses

No records found.

<<
<
0-0 of 0 records
>
>>

Selected Buses

No records found.

<<
<
0-0 of 0 records
>
>>

Select the desired **Transmission owner** area (one at a time) from the drop-down list as shown below. (Refer to the section on PJM Transmission Owner Abbreviations for definitions.)

Generator Connection

Transmission owner * Voltage level Operating mode * Desired MW *

Select one All Injection

- Select one
- AE
- AEP
- AP
- ATSI
- BGE
- CE

Points of interconnection * Maximum: 25

Available Buses

No records found.

<<
<
0-0 of 0 records
>
>>

Selected Buses

No records found.

<<
<
0-0 of 0 records
>
>>

Select the desired **Voltage level** (one at a time or “All”) from the drop-down list as shown below.

The screenshot shows the 'Generator Connection' form. The 'Voltage level' dropdown is open, displaying a list of options: 'All', '115 kV', '138 kV', '161 kV', '230 kV', '345 kV', and '500 kV'. A hand cursor is pointing at the '115 kV' option. Other fields include 'Transmission owner' (AEP), 'Operating mode' (Injection), and 'Desired MW' (empty). A table of 'Points of interconnection' is visible below, and a 'Selected Buses' section shows 'No records found.'

Select the desired **Operating mode** from the drop-down list as shown below. Injection mode is selected for all units that are going to injection megawatts into the grid. Withdrawal is only for evaluating units that had a load or firm/non-firm withdrawal component (battery charging, pumped hydro, MTX).

The screenshot shows the 'Generator Connection' form with the 'Operating mode' dropdown open. The options are 'Injection' and 'Withdrawal'. A hand cursor is pointing at 'Injection'. The 'Voltage level' is now set to '115 kV'. The 'Points of interconnection' table shows three records: '05BLCKCS 115 kV (246932)', '05BLUECK 115 kV (246931)', and '05REDHIL 115 kV (247086)'. The 'Selected Buses' section shows 'No records found.'

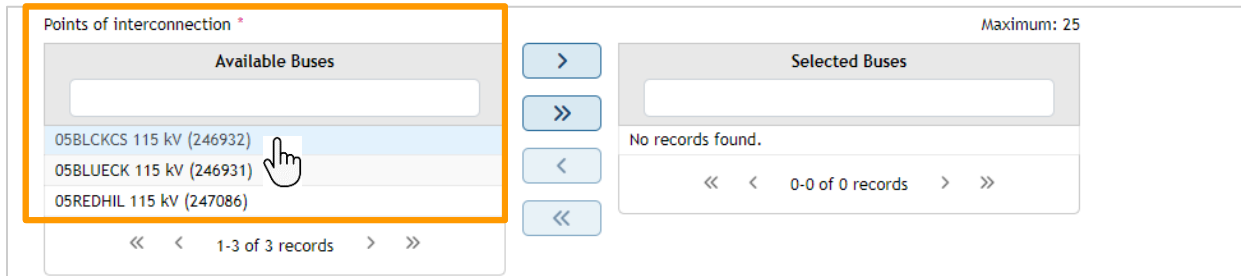
4. Example of User Generator Selection

In this example, the user wants to learn about the impact of a 10 MW solar unit at a specific location on the PJM grid. After going through the above-mentioned steps 1 to 3, the user selects/enters the following:

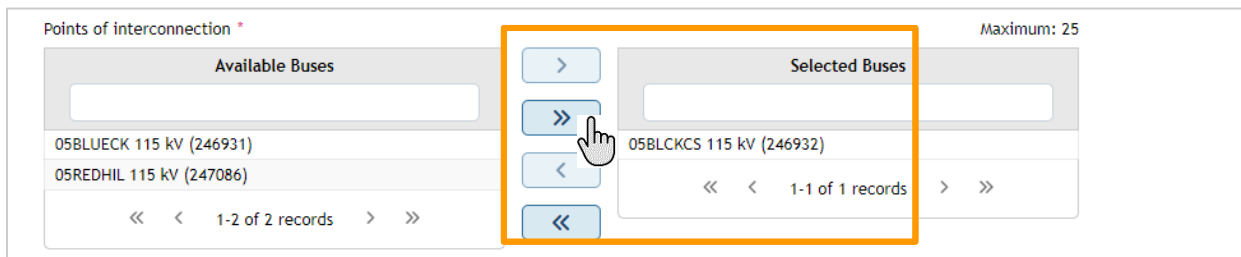
- Transmission owner: “AEP”
- Voltage level: “115 kV”
- Operating mode: “Injection”
- Desired MW: “10 MW”

The screenshot shows the 'Generator Connection' form with the 'Desired MW' field circled in orange and containing the value '10'. The other fields are: 'Transmission owner' (AEP), 'Voltage level' (115 kV), and 'Operating mode' (Injection). The 'Points of interconnection' table is partially visible.

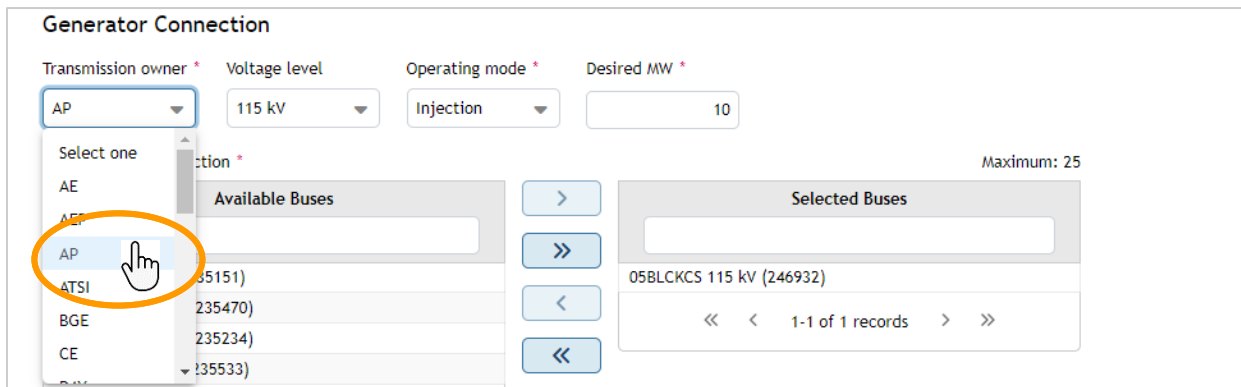
For the three available buses under the **“Point of interconnection”** list, the user selects “05BLCKCS 115 kV (246932)” as shown below:



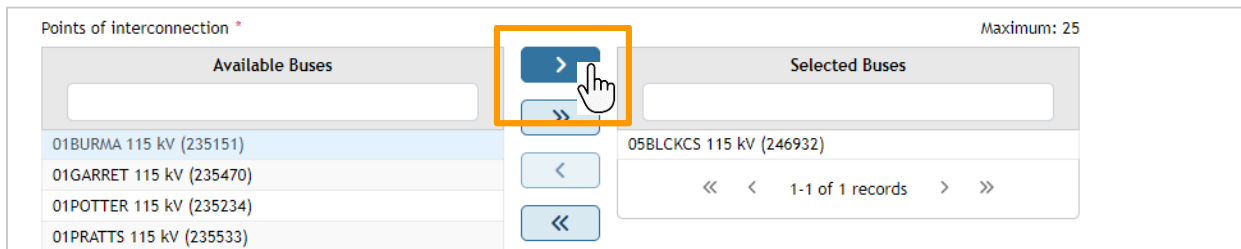
The user then moves the selected bus “05BLCKCS 115 kV (246932)” to the selected buses accumulator by clicking on the right arrow button as shown below:



Alternatively, a user can select additional POIs for batch results. The user in the current example decides to select an additional transmission owner from the drop-down menu. The selected transmission owner is “AP” as shown below:



The user moves the selected bus “01BURMA 115 kV (235151)” to the **Selected Buses** area by clicking on the right arrow button as shown below:



The user now has two different buses “05BLCKCS 115 kV (246932)” and “01BURMA 115 kV (235151)” under the Selected Buses area being evaluated for a solar unit of 10 MW as shown below. Once they click **Submit**, they can see the evaluation results populate in a table at the bottom of the screen.

Points of interconnection * Maximum: 25

Available Buses

01GARRET 115 kV (235470)

01POTTER 115 kV (235234)

01PRATTS 115 kV (235533)

<< < 1-3 of 3 records > >>

>

>>

<

<<

Selected Buses

01BURMA 115 kV (235151)

05BLCKCS 115 kV (246932)

<< < 1-2 of 2 records > >>

Submit

Reset

For this example, the Queue Scope evaluator presents the following results:

- Facilities will be impacted by a 10 MW solar unit injecting at the “01BURMA 115 kV (235151)” bus.
- Facility “920580 AA2-161 TAP 138 235277 01YUKON 138 1” with a single contingency has a pre-loading of 97.25%. With the new 10 MW solar unit loading into the facility, post-loading becomes 97.36%.
- The DFax or the distribution factor of 0.044 or 4.4% shows that the new 10 MW solar unit will only increase the loading on the above-mentioned facility under single contingency conditions.

Note: The default sorting of the results is based on the pre-loading percentage (largest to smallest). However, users can adjust the sorting to be based on the post-loading percentage from largest to smallest (as highlighted in the impact below) to view any facilities impacted by the desired generator.

Evaluation Results

01BURMA 115 kV (235151) Export: [XLS](#)

| Transmission Facility | Contingency Type | Available (MW) | DFax | Impact (MW) | Pre-Loading (%) | Post-Loading (%) |
|---|------------------|----------------|-------|-------------|-----------------|------------------|
| 920580 AA2-161 TAP 138 235277 01YUKON 138 1 | Single | 11 | 0.044 | 0.44 | 97.25 | 97.36 |
| 920580 AA2-161 TAP 138 235277 01YUKON 138 1 | Breaker | 11 | 0.044 | 0.44 | 97.23 | 97.34 |
| 920570 AA2-161 TAP 138 235277 01YUKON 138 1 | Single | 14 | 0.044 | 0.44 | 96.32 | 96.43 |
| 920570 AA2-161 TAP 138 235277 01YUKON 138 1 | Breaker | 14 | 0.044 | 0.44 | 96.29 | 96.40 |
| 235256 01SPGD 138 235222 01MURRYC 138 1 | Tower | 78 | 0.030 | 0.30 | 74.82 | 74.92 |
| 235256 01SPGD 138 235222 01MURRYC 138 1 | Breaker | 78 | 0.030 | 0.30 | 74.82 | 74.92 |
| 239036 02PERRY 345 239334 02L.CENTER 345 1 | Tower | 476 | 0.134 | 1.34 | 71.43 | 71.51 |
| 235152 01BUTLER 138 235246 01SHANOR 138 1 | Single | 134 | 0.076 | 0.76 | 70.34 | 70.51 |
| 242931 05BEVERL 345 242940 05MUSKNG 345 1 | Single | 305 | 0.027 | 0.27 | 68.60 | 68.63 |
| 235246 01SHANOR 138 235205 01KRENDL 138 1 | Single | 144 | 0.076 | 0.76 | 68.19 | 68.36 |
| 242931 05BEVERL 345 242940 05MUSKNG 345 1 | Breaker | 311 | 0.022 | 0.22 | 67.96 | 67.98 |
| 920580 AA2-161 TAP 138 235277 01YUKON 138 1 | Single | 103 | 0.025 | 0.25 | 67.24 | 67.32 |
| 239036 02PERRY 345 238684 02EASTLK 345 1 | Tower | 574 | 0.129 | 1.29 | 65.55 | 65.63 |
| 200726 26SHAWVL 2 230 235248 01SHINGL 230 1 | Bus | 232 | 0.052 | 0.52 | 65.13 | 65.21 |
| 200726 26SHAWVL 2 230 235248 01SHINGL 230 1 | Breaker | 232 | 0.052 | 0.52 | 65.12 | 65.20 |

Records Per Page: 15 << < 1-15 of 159 records > >>

Using the **Evaluation Results** drop-down list, facilities being impacted by the 10 MW solar unit injection at the alternative “05BLCKCS 115 kV (246932)” bus can be selected as shown below:

| Evaluation Results | | | | | | | |
|---|------------------|------------------|-------|----------------|-----------------|------------------|-----------------------------|
| 01BURMA 115 kV (235151) | | Contingency Type | | Available (MW) | DFax | Impact (MW) | Export: XLS |
| 05BLCKCS 115 kV (246932) | | All | | | | | |
| Transmission Facility | Contingency Type | Available (MW) | DFax | Impact (MW) | Pre-Loading (%) | Post-Loading (%) | |
| 920580 AA2-161 TAP 138 235277 01YUKON 138 1 | Single | 11 | 0.044 | 0.44 | 97.25 | 97.36 | |
| 920580 AA2-161 TAP 138 235277 01YUKON 138 1 | Breaker | 11 | 0.044 | 0.44 | 97.23 | 97.34 | |

The evaluation presents the following results:

- Facilities are impacted by the 10 MW solar unit injection at “05BLCKCS 115 kV (246932)” bus.
- Facility “242935 05E LIMA 345 242989 05E LIMA 138 2” with a breaker contingency has a pre-loading of 100.15%. With the new solar unit loading into the facility, the post-loading becomes 100.32%.
- The DFax or the distribution factor of 0.063 or 6.3% shows that the new unit will only increase the loading on the above-mentioned facility under breaker contingency conditions.

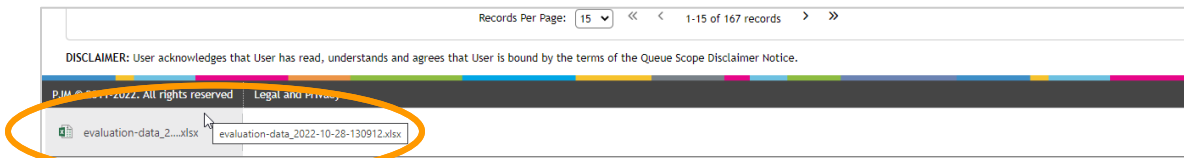
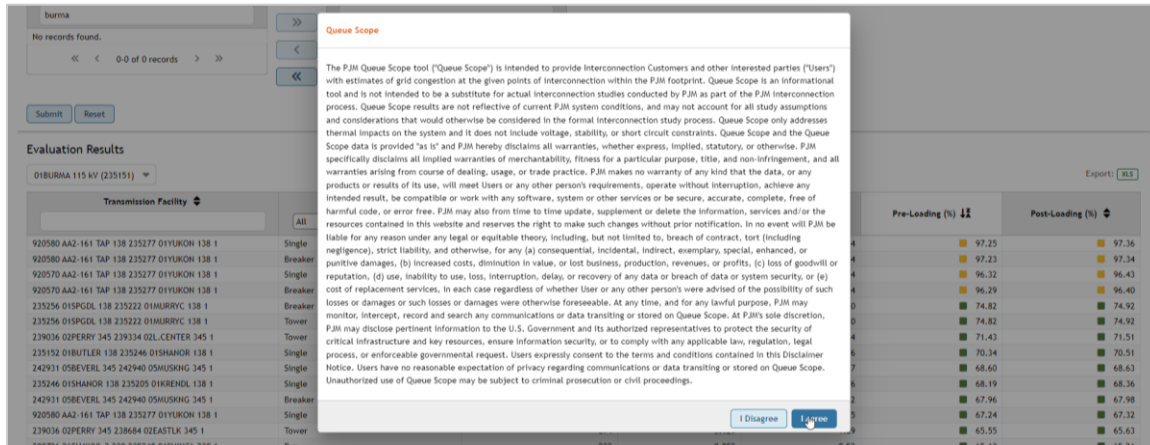
| Evaluation Results | | | | | | | |
|--|------------------|------------------|-------|----------------|-----------------|------------------|-----------------------------|
| 05BLCKCS 115 kV (246932) | | Contingency Type | | Available (MW) | DFax | Impact (MW) | Export: XLS |
| All | | | | | | | |
| Transmission Facility | Contingency Type | Available (MW) | DFax | Impact (MW) | Pre-Loading (%) | Post-Loading (%) | |
| 242935 05E LIMA 345 242989 05E LIMA 138 2 | Breaker | 0 | 0.063 | 0.63 | 100.15 | 100.32 | |
| 238551 02AVON 345 241930 02AVQ4 138 92 | Breaker | 65 | 0.024 | 0.24 | 89.48 | 89.52 | |
| 242935 05E LIMA 345 242989 05E LIMA 138 2 | Single | 46 | 0.063 | 0.63 | 87.61 | 87.78 | |
| 239289 02HAYES 345 239290 02HAYES 138 1 | Tower | 63 | 0.025 | 0.25 | 87.17 | 87.22 | |
| 237081 AA2-121 TAP 345 235707 01WYLLIE R 345 1 | Single | 182 | 0.040 | 0.40 | 87.09 | 87.12 | |
| 242933 05RPMONE 345 243211 05ALLEN 345 1 | Breaker | 122 | 0.998 | 9.98 | 86.35 | 87.46 | |
| 237081 AA2-121 TAP 345 235707 01WYLLIE R 345 1 | Breaker | 224 | 0.040 | 0.40 | 84.08 | 84.11 | |
| 247463 05SCANTO_XFL 345 242943 05SCANTO 345 Z1 | Single | 308 | 0.036 | 0.36 | 83.49 | 83.51 | |
| 247463 05SCANTO_XFL 345 242943 05SCANTO 345 Z1 | Breaker | 358 | 0.020 | 0.20 | 80.84 | 80.85 | |
| 237081 AA2-121 TAP 345 235707 01WYLLIE R 345 1 | Bus | 292 | 0.029 | 0.29 | 79.30 | 79.32 | |
| 248001 06DEARB1 345 248013 06PIERCE 345 1 | Tower | 204 | 0.022 | 0.22 | 79.04 | 79.06 | |
| 248001 06DEARB1 345 248013 06PIERCE 345 1 | Breaker | 204 | 0.022 | 0.22 | 79.04 | 79.06 | |
| 247463 05SCANTO_XFL 345 242943 05SCANTO 345 Z1 | Tower | 396 | 0.026 | 0.26 | 78.80 | 78.81 | |
| 246950 05TIMBSS 138 246352 05HAVILAND2 138 1 | Breaker | 55 | 0.034 | 0.34 | 77.14 | 77.28 | |
| 238874 02LAKVIEW 138 238768 02GRNFLD 138 1 | Tower | 89 | 0.026 | 0.26 | 76.84 | 76.91 | |

Users can export and download the results of the evaluation table into an Excel output file (.xls) as shown below.

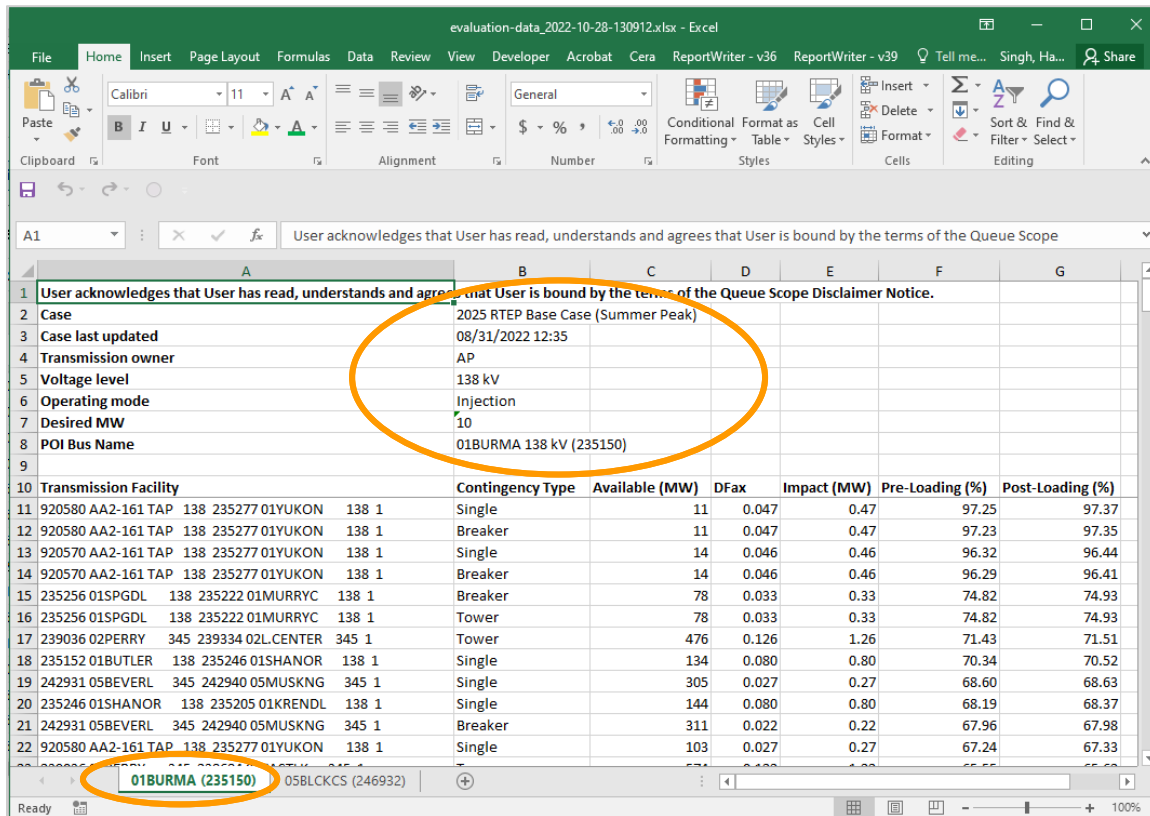
Please note that this option is only available to users with established PJM user accounts. The public tool does not have the capability to download results.

| Evaluation Results | | | | | | | |
|---|------------------|------------------|-------|----------------|-----------------|------------------|-----------------------------|
| 01BURMA 115 kV (235151) | | Contingency Type | | Available (MW) | DFax | Impact (MW) | Export: XLS |
| All | | | | | | | |
| Transmission Facility | Contingency Type | Available (MW) | DFax | Impact (MW) | Pre-Loading (%) | Post-Loading (%) | |
| 920580 AA2-161 TAP 138 235277 01YUKON 138 1 | Single | 11 | 0.044 | 0.44 | 97.25 | 97.36 | |
| 920580 AA2-161 TAP 138 235277 01YUKON 138 1 | Breaker | 11 | 0.044 | 0.44 | 97.23 | 97.34 | |

After agreeing to the disclaimer, the Excel file will be downloaded and automatically be named “evaluation-data” with date and time stamps as shown below.



The Excel file will contain multiple tabs with all the input user settings for every POI selected for analysis by the user.



Section 6: Geospatial Application Overview & Workflow

Display Overview

Queue Scope’s geospatial application displays transmission availability (headroom) on the grid based on a user-defined generator at various locations across the PJM transmission system.

When first accessing the application, the user will be prompted to accept terms of use and acknowledge the PJM legal disclaimer before using the tool as shown in **Figure 6.1** **Figure 5.1**.

Users can select inputs such as the case years/type, search by transmission owner area and voltage level or bus name/bus number, and operating mode before loading and selecting one or multiple POIs for evaluation. Once POIs are selected by the user and added to the selected buses window, the user can enter a desired megawatt amount and select the final list of POIs before running the evaluation as shown in **Figure 6.2**. After clicking the “Run Study” button, the application runs the analysis and generates the evaluation results in a table as shown in **Figure 6.3** **Figure 5.3**. The results contain a list of flowgates with facility name, contingency type, available megawatts, distribution factor (related to the selected POI bus), impact megawatts, pre-loading level and post-loading level. In addition to these standard features, Queue Scope’s geospatial application includes the following additional features:

- Coordinate Search: Lat/Long as shown in **Figure 6.4**
- Pre-Loading Status Symbology & Filtering as shown in **Figure 6.5**
- Congestion Overlay as shown in **Figure 6.6**
- Transmission Lines Overlay (kV Filter) as shown in **Figure 6.7**
- Generator Deactivations Filter as shown in **Figure 6.8**
- New Service Request Filter as shown in **Figure 6.9**
- Legend **Figure 6.10**

Figure 6.1. Disclaimer Acknowledgment

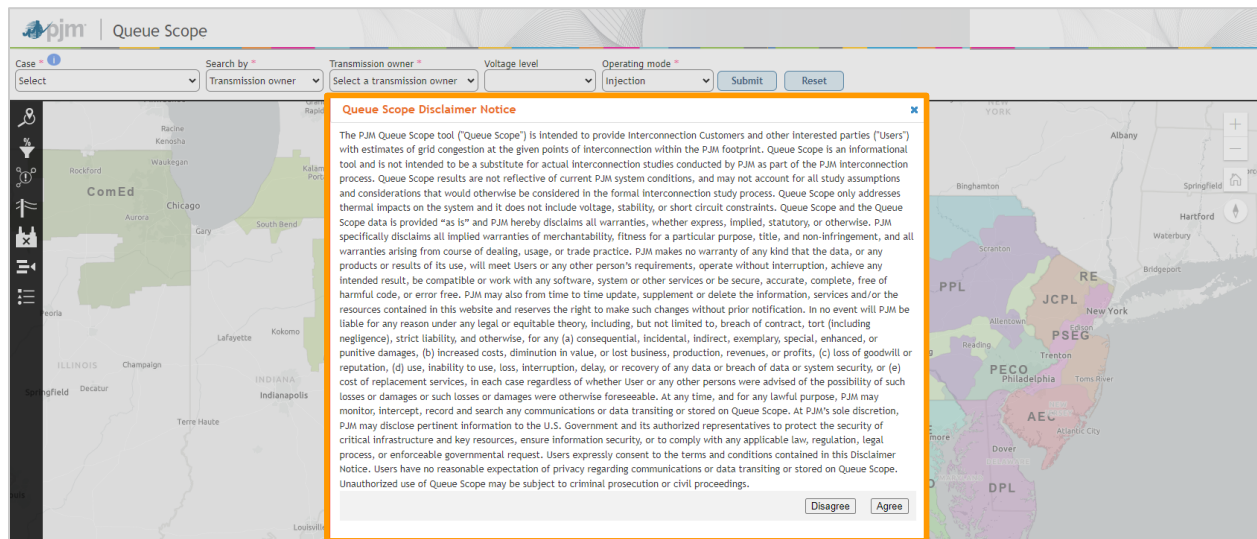


Figure 6.2. User Inputs

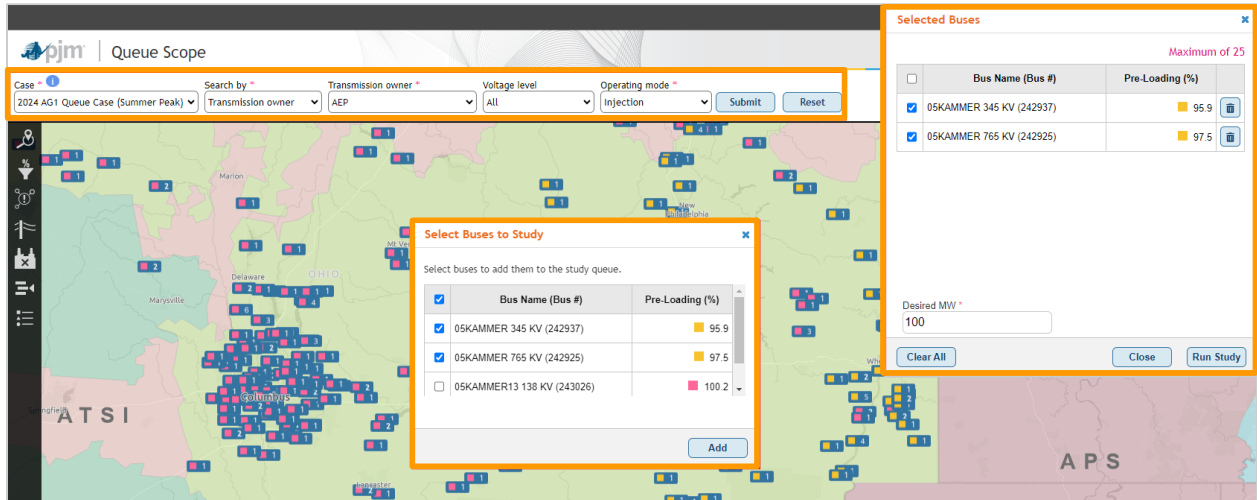


Figure 6.3. Output Results

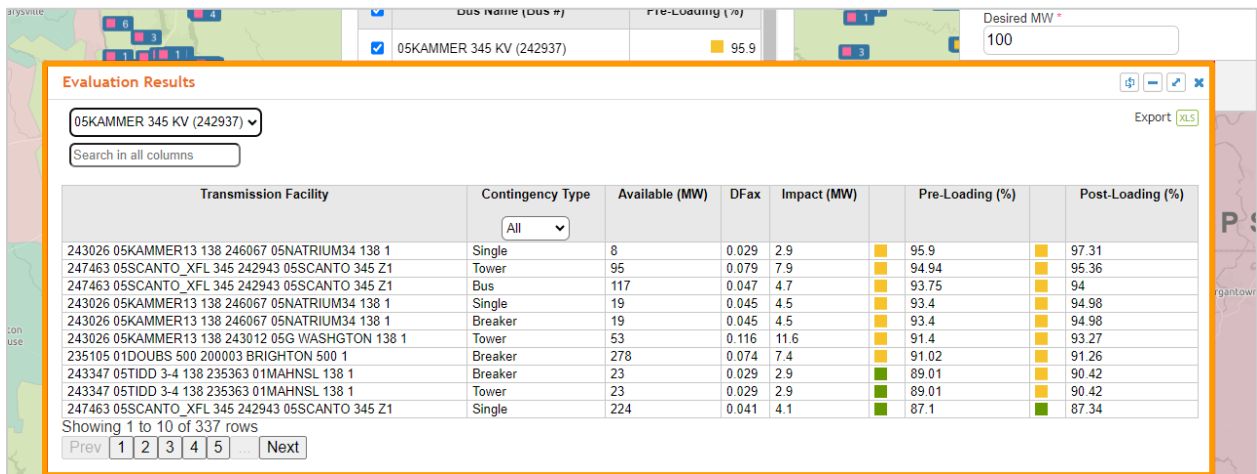


Figure 6.4. Coordinate Search: Lat/Long

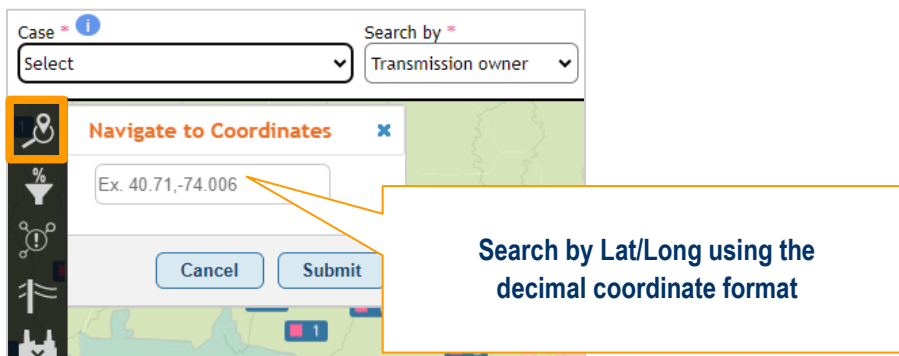


Figure 6.5. Pre-Loading Status Symbology & Filtering

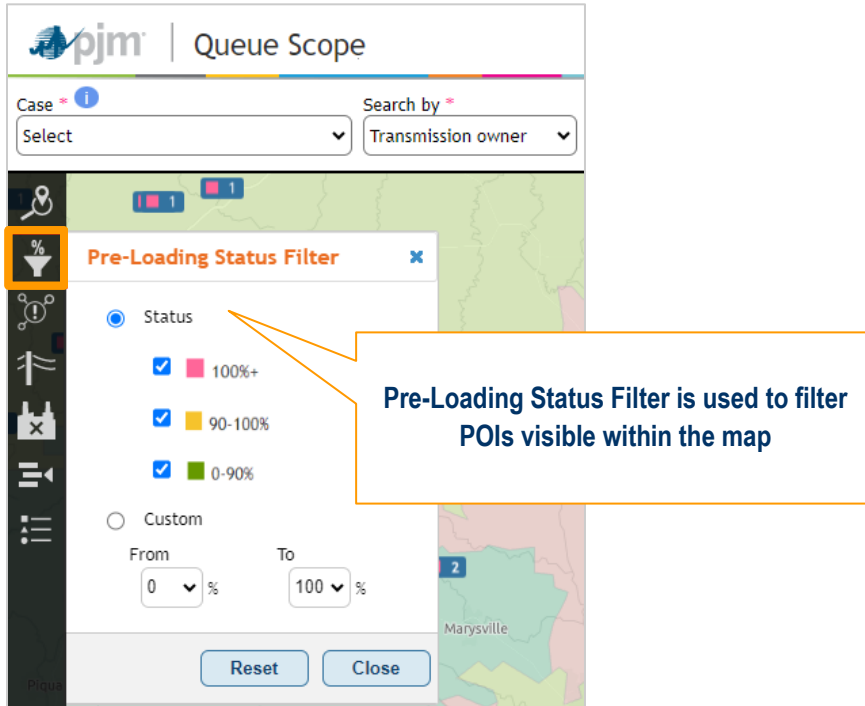


Figure 6.6. Congestion Overlay (Thermal Facility Loading by POI Bus)

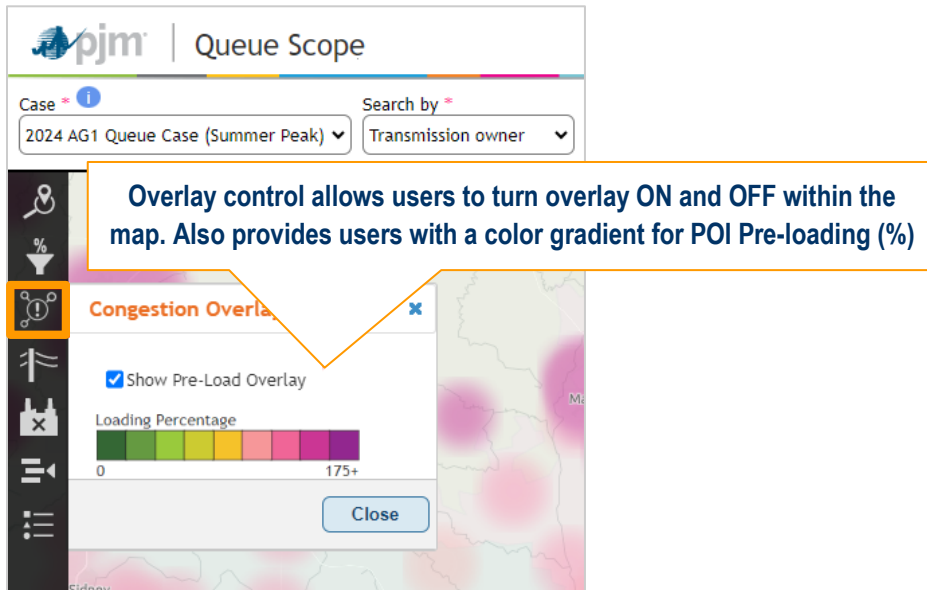


Figure 6.7. Transmission Lines Overlay (kV Filter)

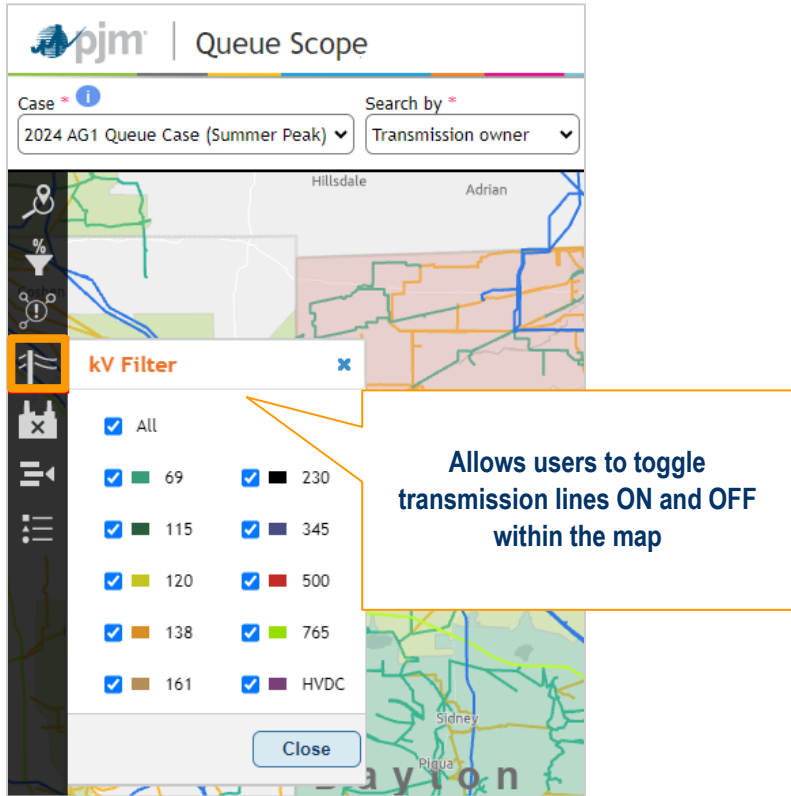


Figure 6.8. Generator Deactivations Filter

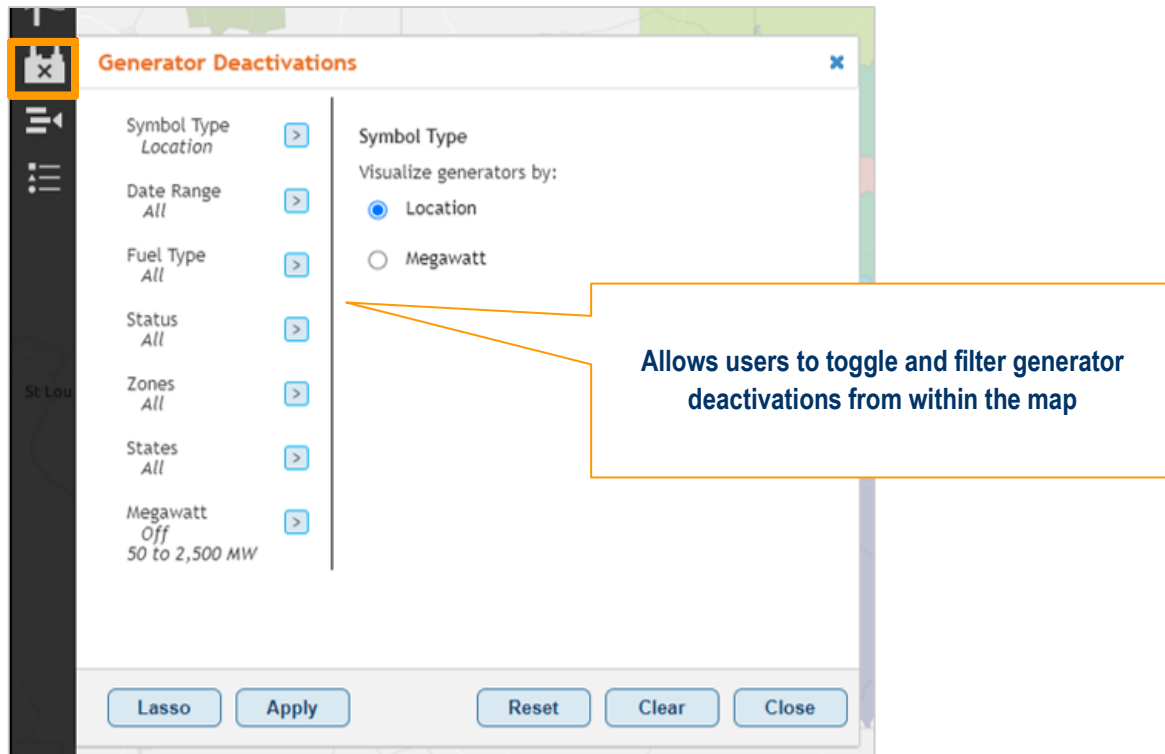


Figure 6.9. New Service Request Filter

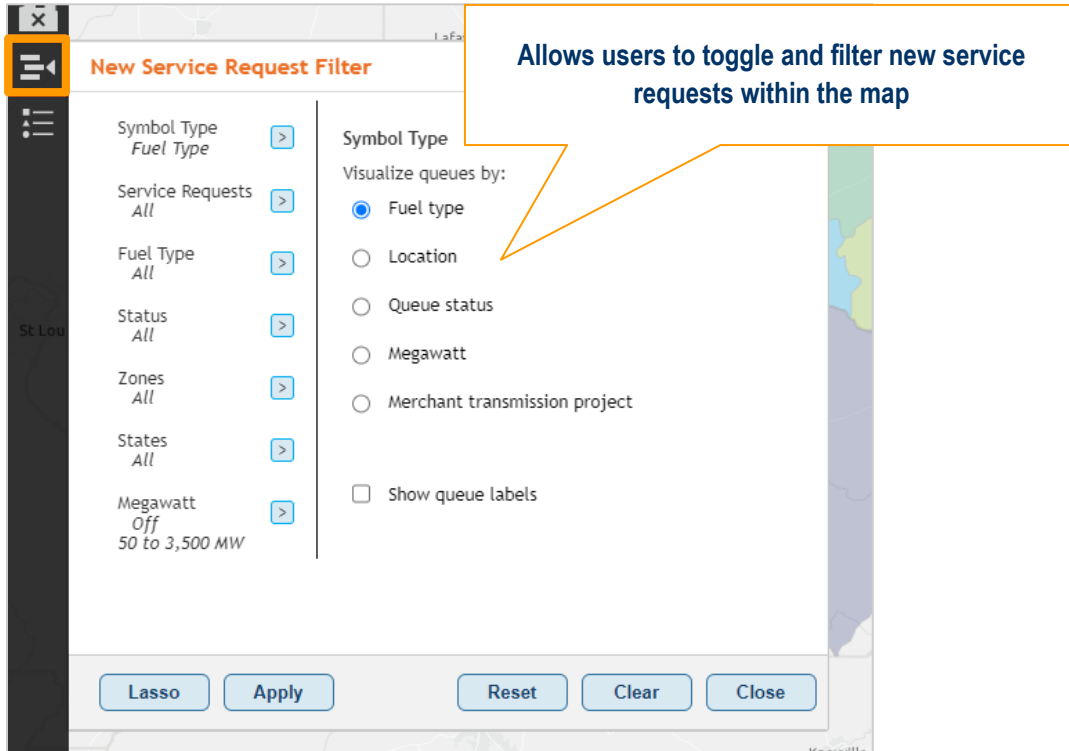
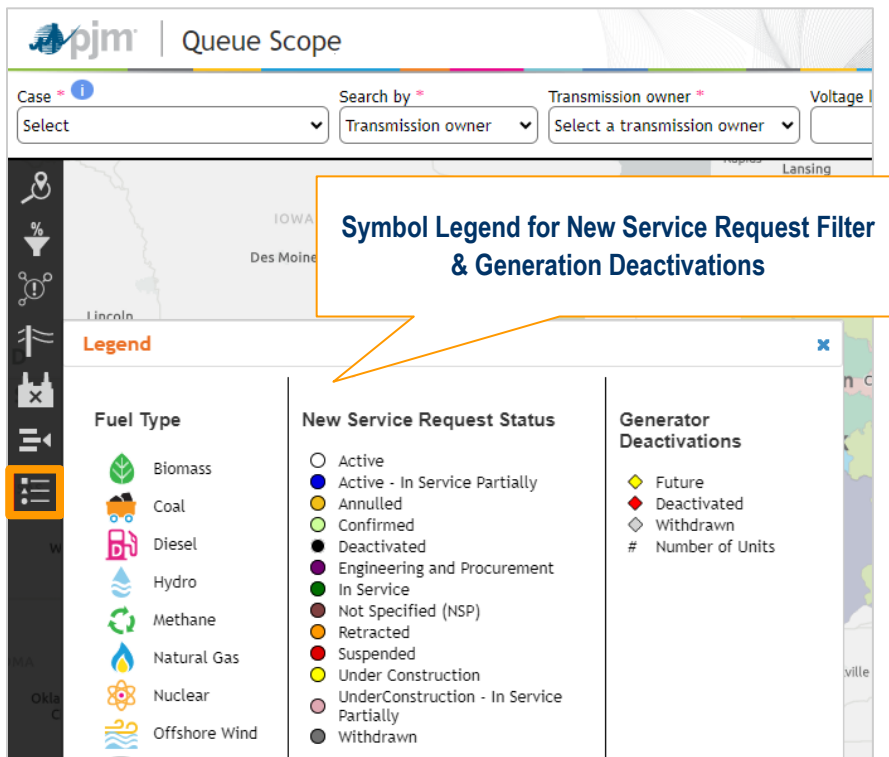


Figure 6.10. Legend



How To Use the Tool: General Walk-Through

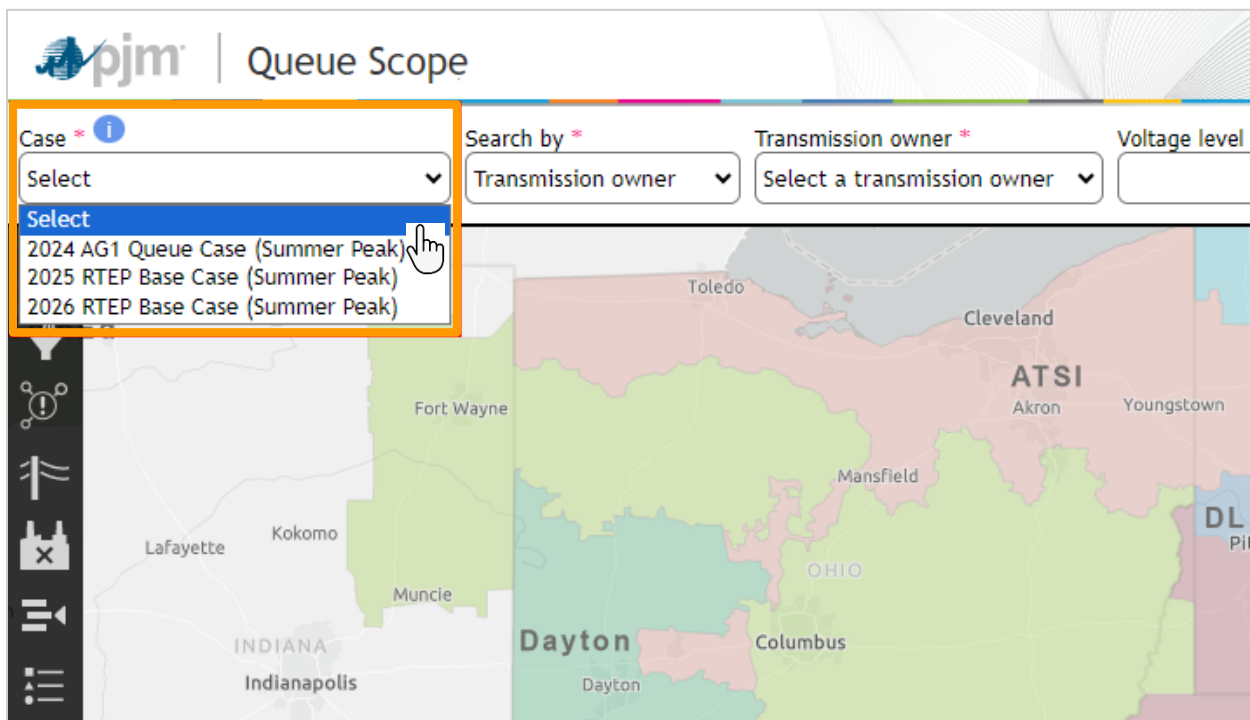
This section contains the general steps on how to use the geospatial application to run POI evaluations and leverage other geospatial features.

1. Case Selection

First, select a case, which corresponds to the case study results stored in the Queue Scope database. This can be a case used for Queue/Cycle studies labeled as the Queue or Cycle case or the yearly PJM Planning base case labeled as the RTEP base case.

Note: The RTEP base case studies only include generation with executed interconnection agreements.

Select the desired **case** from the drop-down list as shown below.

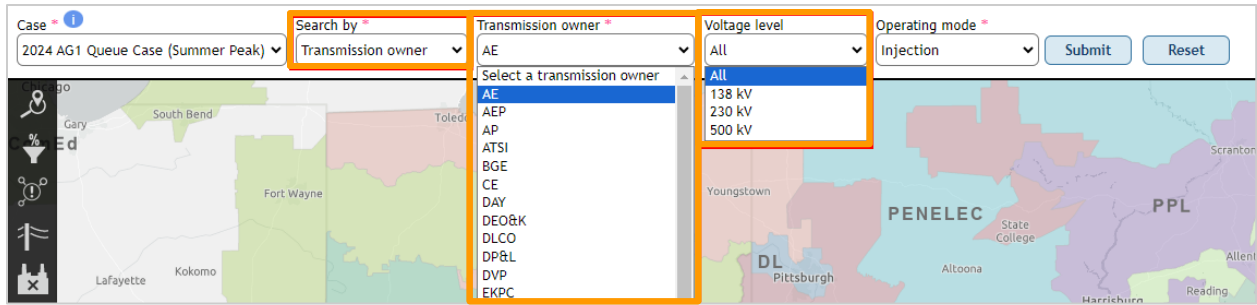


Once the case is selected, the dataset is loaded for use within the rest of the application’s workflow and running POI evaluations.

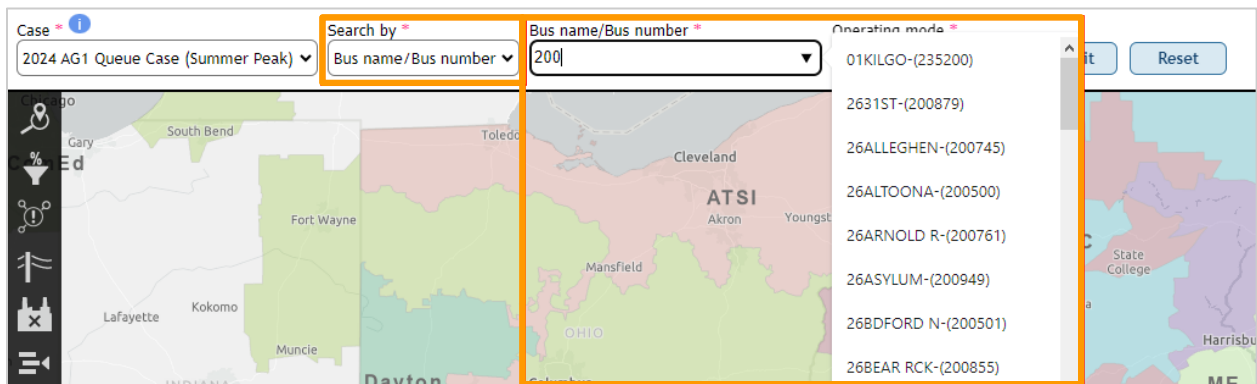
2. Search by Feature

After making the case selection, click on the “**Search by**” feature to select either “Transmission Owner” or “Bus name/Bus number” to search for potential POI buses within the PJM footprint on the map.

When “**Transmission Owner**” is selected, a drop-down is populated with all of the different PJM Transmission Owners within the case dataset. Once the selection is made for Transmission Owner and the applicable voltage level, only POI buses within the Transmission Owner footprint and that voltage level will be loaded in the map for selection and evaluation.



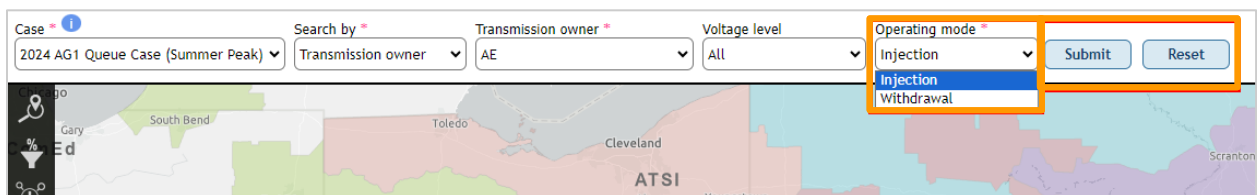
Alternatively, if “Bus name/Bus number” is selected, type in a bus name or bus number in the corresponding field, which will query the available buses in the case dataset. This field includes a predictive search feature that will populate a list of possible matches. Only a single bus can be selected by using this search feature.



3. Operating Mode and Submit

Once the targeted search feature is selected for Transmission Owner or Bus name/Bus number, the **Operating mode** must be selected based on whether the proposed generator interconnection needs to be assessed for injecting MWs or withdrawing MWs (battery charging, pumped storage, MTX) from the PJM grid. This ensures the correct flowgates (facility loading) are reported for each POI bus that is run through the evaluation in the tool. Once the operating mode is selected, select **Submit** to load the POI buses in the map. All of the POI buses will be related to a location in the map, which in most cases will be an existing substation. After clicking **Submit**, the map will pan and zoom to the desired cohort of POI bus locations.

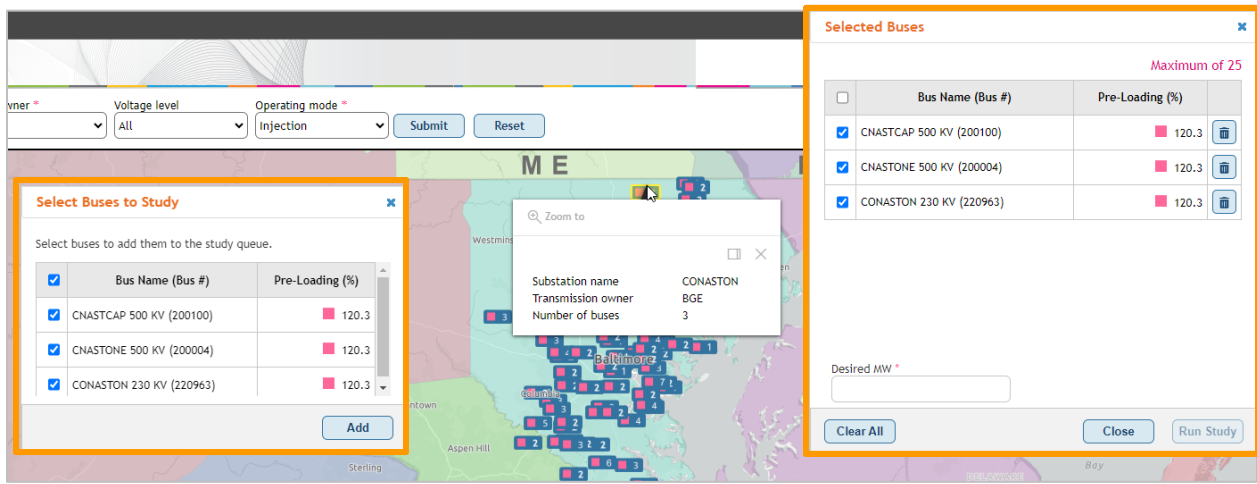
Note: Depending on the size of the Transmission Owner footprint, there may be a momentary delay until the results are presented in the map due to the volume of POI buses that need to be processed for viewing.



4. Point of Interconnection (POI) Selection

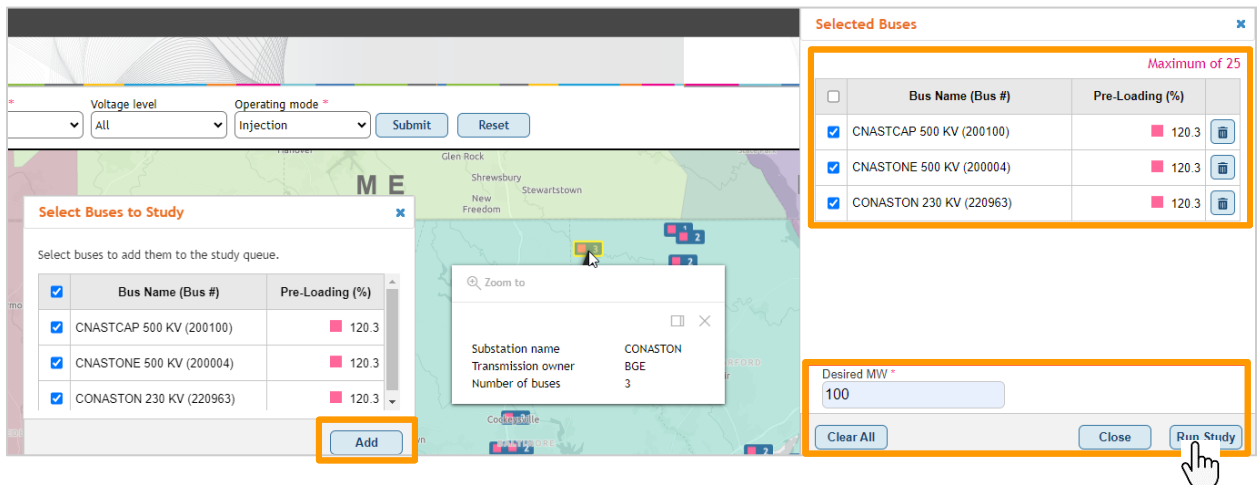
Once the substation symbols with the associated POI buses are visible in the map, select any symbol to review the POI buses at that location. In many instances, multiple POI buses may be available at each location with different voltage levels. Select specific POI buses to add to a new study for a generator interconnection. After clicking **Add**, a “Selected Buses” window will appear in the top right corner of the application in order to select which buses to include in a study based on the desired MWs entered.

Users can also add buses to the “Selected Buses” window from different substation locations across the Transmission Owner footprint.



5. Run Study and Evaluation Results

After selecting the desired POI buses at one or multiple locations and clicking **Add**, the “Selected Buses” window will appear. Enter the desired MWs for the generator based on injection or withdrawal and then select the final set of POI buses to include in the study. Select **Run Study** to run the analysis and view the evaluation results in a table format. The table of results can be filtered and sorted as well as exported to an Excel file for offline review.



Note: Users are limited to selecting a maximum of 25 buses in the “Selected Buses” window when running a study. When users download the evaluation results to an Excel file, the user may be prompted to recover the file before it will load. The file can be recovered and will contain all of the evaluation results without any data errors.

The screenshot shows the Queue Scope interface. At the top, there are filters for Case (2024 AG1 Queue Case (Summer Peak)), Search by (Transmission owner), Transmission owner (BGE), Voltage level (All), and Operating mode (Injection). Below the filters is a map of the PJM footprint with several buses marked. A 'Selected Buses' window is open, showing a list of three buses: CNASTCAP 500 KV (200100), CNASTONE 500 KV (200004), and CONASTON 230 KV (220963), all with a Pre-Loading (%) of 120.3. An 'Evaluation Results' window is also open, displaying a table of results for the selected bus. The table includes columns for Transmission Facility, Contingency Type, Available (MW), DFax, Impact (MW), Pre-Loading (%), and Post-Loading (%). The table shows 10 rows of data, with a total of 274 rows. A 'Run Study' button is highlighted in the bottom right corner.

| Transmission Facility | Contingency Type | Available (MW) | DFax | Impact (MW) | Pre-Loading (%) | Post-Loading (%) |
|--|------------------|----------------|-------|-------------|-----------------|------------------|
| 232012 HOPE CREEK 230 200029 HOPE CRK 500 1 | Breaker | 0 | 0.026 | 2.6 | 120.35 | 120.58 |
| 223938 DICKH230 230 223937 DICK 230 230 1 | Breaker | 0 | 0.041 | 4.1 | 118.85 | 119.45 |
| 232013 SILVER RUN 230 232014 LSPWR CABLE 230 1 | Breaker | 0 | 0.026 | 2.6 | 116.9 | 117.13 |
| 200599 26ERIE W 345 238547 02AT 345 1 | Bus | 0 | 0.032 | 3.2 | 110.52 | 110.69 |
| 200014 SALEM 500 200063 ORCHARD 500 1 | Breaker | 0 | 0.022 | 2.2 | 109.85 | 109.93 |
| 200599 26ERIE W 345 238547 02AT 345 1 | Single | 0 | 0.032 | 3.2 | 107.81 | 108.02 |
| 200013 PCHBTMZN 500 200024 LIMERICK 500 1 | Breaker | 0 | 0.127 | 12.7 | 102.94 | 103.37 |
| 200599 26ERIE W 345 238547 02AT 345 1 | Single | 0 | 0.032 | 3.2 | 100.01 | 100.18 |
| 223938 DICKH230 230 223937 DICK 230 230 1 | Single | 15 | 0.031 | 3.1 | 97.82 | 98.28 |
| 223938 DICKH230 230 223937 DICK 230 230 2 | Single | 15 | 0.031 | 3.1 | 97.82 | 98.28 |

6. Additional Features

Navigate to Coordinates

This feature allows users to pan and zoom to a specific location within the PJM footprint using a decimal degree latitude/longitude format. Once the user pans and zooms to a location, they will be able to select the applicable transmission owner area to view and select POI buses in the local vicinity of the entered coordinate location.

The screenshot shows the 'Navigate to Coordinates' dialog box. It has a 'Case' dropdown set to 'Select' and a 'Search by' dropdown set to 'Transmission'. The dialog box has a title bar that says 'Navigate to Coordinates'. Below the title bar is a text input field with the example coordinate 'Ex. 40.71,-74.006'. At the bottom of the dialog box are 'Cancel' and 'Submit' buttons. The background shows a map of the PJM footprint with a location marked.

Pre-Loading Status Filter

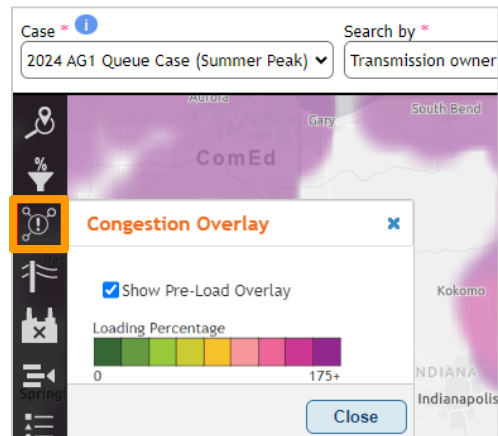
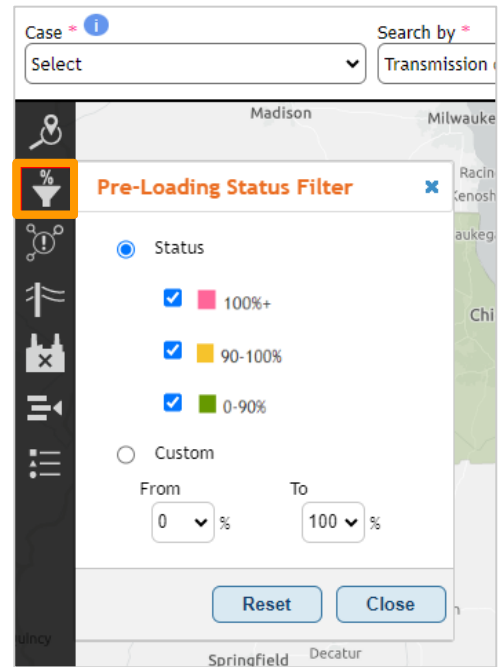
This feature provides a user with a combined legend and filter for substation/POI bus loading percentage and the corresponding color. The filtering capability allows users to filter substation/POI bus symbols based on three pre-loading (%) ranges or via the use of a custom-defined loading range.

Congestion Overlay

The congestion overlay gives the user the ability to visualize the facility loading at each substation/POI bus across the entire PJM footprint based on the selected case dataset. This visualization (often referred to as a heat map) can provide an indication on available transmission headroom across the PJM footprint and also give an indication on the severity of facility thermal loading based on generator impacts within a study. Once loaded, the overlay will dynamically update as the user pans around and/or zooms within the map. Lastly, the congestion overlay is merely a visual representation of the most severe thermal facility impacts by POI as seen in the results coming from the Generator Deliverability test.

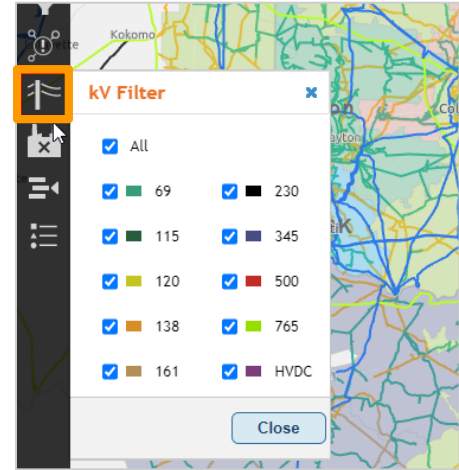
Note: This overlay is not related to the market-based definition of grid congestion and merely provides a visualization of facility transmission loading by POI.

Due to the volume of POI buses in the case dataset (over 6,000), it may take 5-10 seconds until the overlay is fully rendered and visible to the user. This is due to the processing time required for the size of the dataset and rendering within the web-based application. Once the overlay is rendered, it can be toggled **off** and **on** without a noticeable delay in processing.



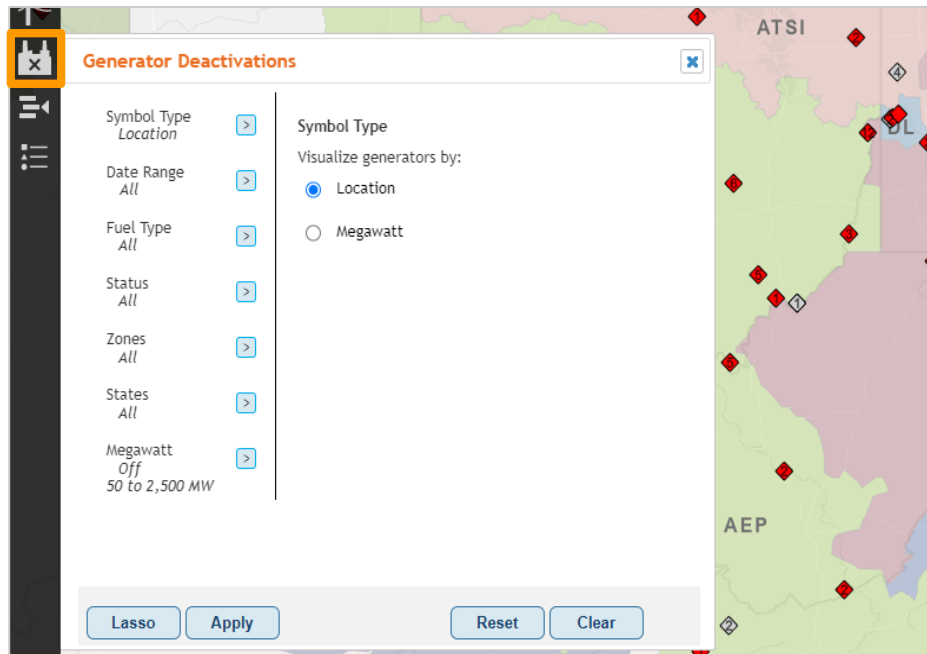
kV Filter

The kV filter (or transmission lines filter) allows users to load a layer of all the transmission lines within the PJM footprint. This layer is identical to the transmission lines seen in the PJM System Map application. Users can filter by voltage class and see an overview of the corresponding line coloring by voltage class.



Generator Deactivations

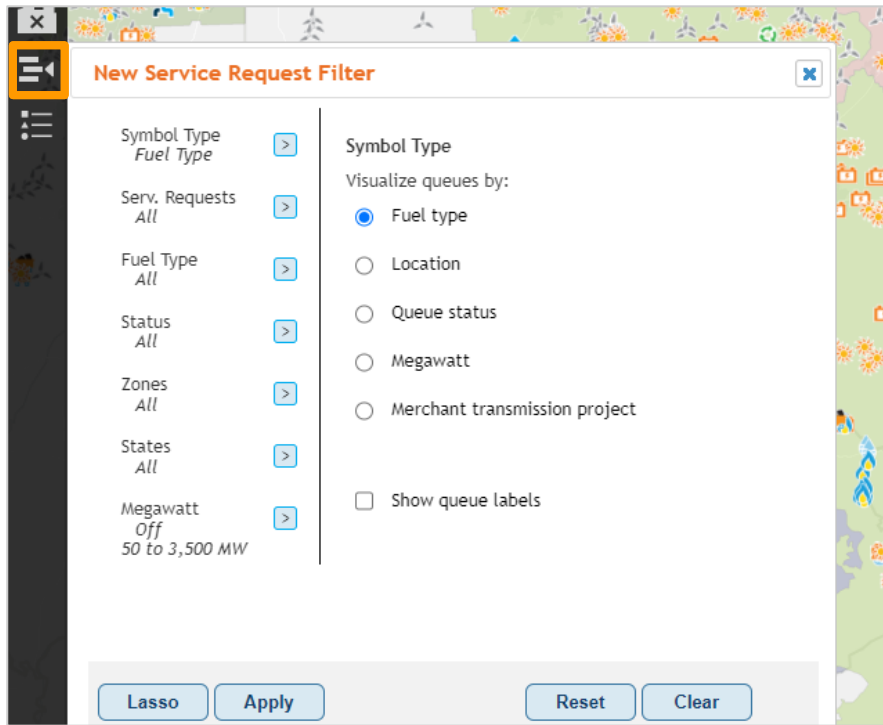
The generator deactivations filter is nearly identical to the layer/filter provided to users in the existing PJM System Map application. This filter will allow users to display future deactivations, deactivated generators and withdrawn deactivations while using the geospatial application to assess potential generator impacts at various points of interconnection. As shown below, there are various filtering options based on date of the request/event, fuel type, status, location and size. A legend is also available at the bottom of the left-hand navigation menu, which provides an overview of all of the generator deactivation symbols and coloring.



New Service Request Filter

The new service request filter is nearly identical to the layer/filter provided to users in the existing PJM System Map application. This filter allows users to display all types of projects that ever entered the queue/cycle study process within PJM. This includes all projects with statuses such as Active, Withdrawn, Deactivated, Engineering & Procurement and Under Construction. Users can see past and present projects proposed across the PJM system to help assist with the POI assessment process. This also allows users to review existing projects near any potential POIs and further review any posted system impact studies on PJM.com.

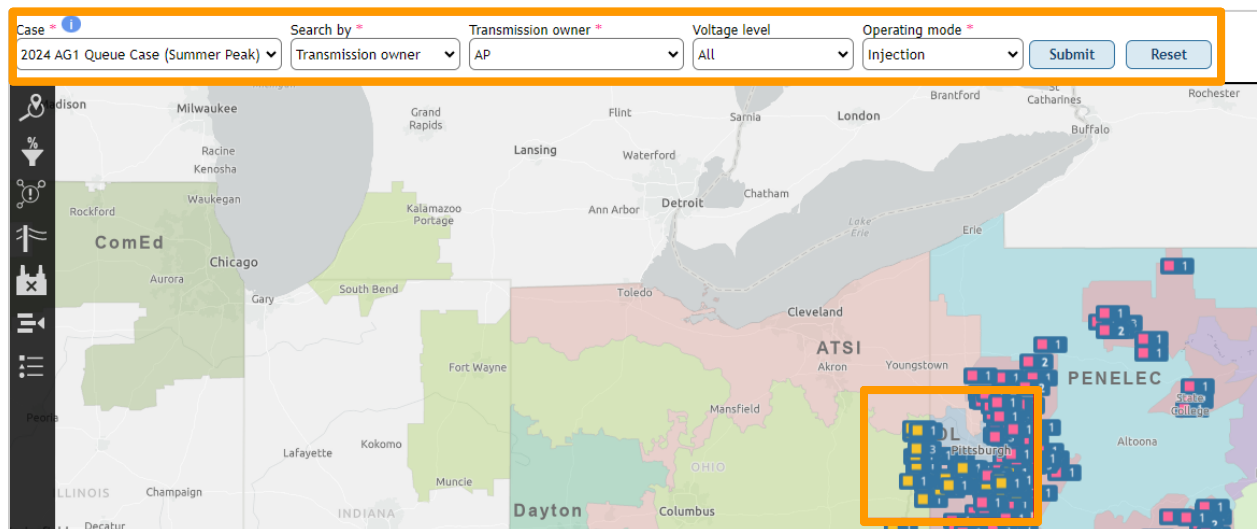
Much like the generator deactivations filter, there are various filtering options based on the request name, fuel type, status, location and size. A legend is also available at the bottom of the left-hand navigation menu, which provides an overview of all of the queue/cycle project symbols based on fuel type and queue/cycle status.



7. Example of User Generator Selection

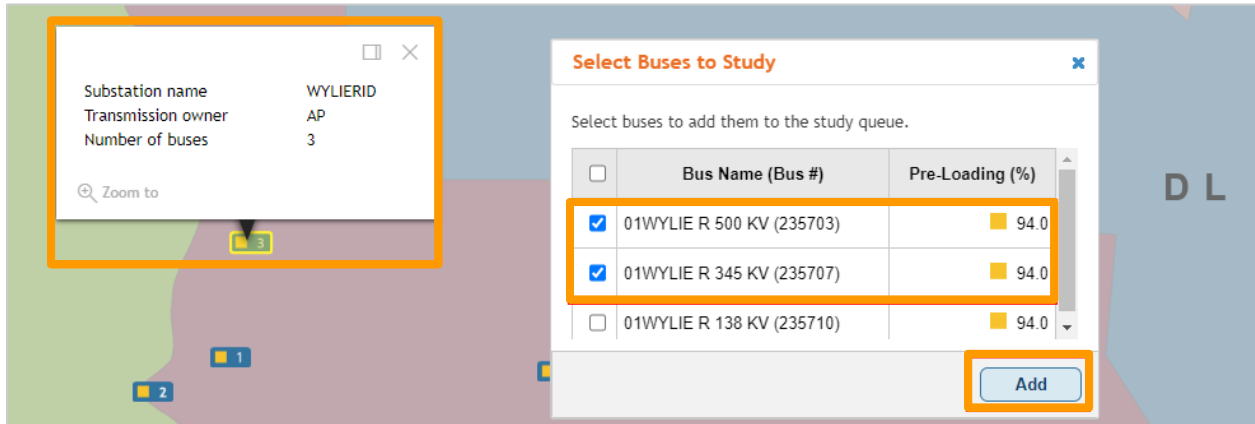
In this example, the user wants to assess the potential impact of a 100 MW solar unit at a specific location on the PJM grid. After going through the above-mentioned steps 1 to 3, the user selects/enters the following:

- Search:**
Transmission owner
- Transmission owner:**
AP
- Voltage level:**
All
- Operating mode:**
Injection

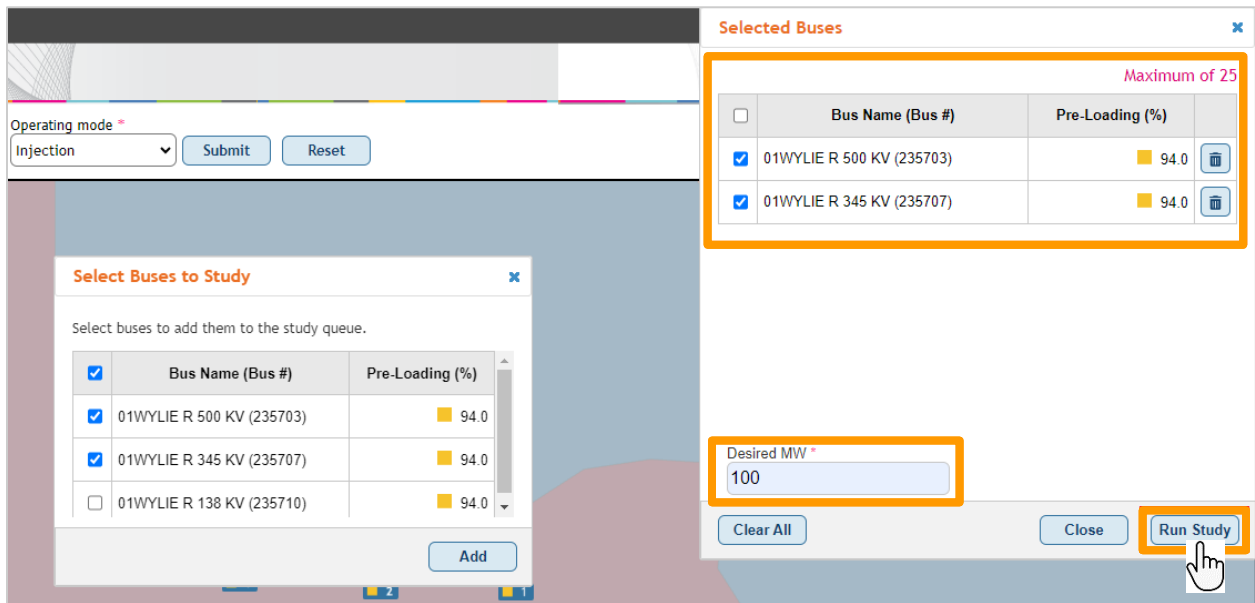


Once all of the potential locations are loaded with the available POI buses, the user decides to pan and zoom in on substation Wylie Ridge within the AP transmission owner footprint. A hover box is presented with the number of available buses for selection in running a study. Once the substation symbol is selected by the user, a **“Select Buses to Study”** window appears for user selection of buses to run in a study. In this instance, there are three buses available at 500 kV, 345 kV and 138 kV.

The user then selects the 500 kV (235703) and 34 5kV (235707) buses to add to the study.



Once the user selects the **“Add”** button, a **“Selected Buses”** window will appear in the top right corner of the screen, which allows the user to input the desired MWs of 100 to inject at each bus location. The user must select the buses in this window to ensure they are run in the study. Once the buses are selected and the desired MWs are entered, the user selects the **“Run Study”** button to produce the evaluation results.



Once the user clicks **Run Study**, the tool will run an evaluation of the 100 MW injection at each bus and produce a table of results where the user can toggle between the POI buses for reviewing the impacts. The results can be filtered by using a text search function and a contingency-type drop-down or the results can be sorted (ascending/descending) by selecting a column header.

Evaluation Results

01WYLIE R 500 KV (235703) Remove Bus

01WYLIE R 500 KV (235703)
01WYLIE R 345 KV (235707)

| Transmission Facility | Contingency Type | Available (MW) | DFax | Impact (MW) | Pre-Loading (%) | Post-L |
|--|------------------|----------------|-------|-------------|-----------------|--------|
| 239092 02SAMMIS 345 253902 15BVRVAL 345 S1 | Breaker | 71 | 0.097 | 9.7 | 94.02 | 94.83 |
| 235105 01DOUBS 500 200003 BRIGHTON 500 1 | Breaker | 278 | 0.059 | 5.9 | 91.02 | 91.21 |

At the bottom of the table there is the option to select additional pages of results and a total row count is provided to indicate the number of reported flowgates at the POI bus. In this case there are 152 flowgates reported for Bus 235703 and 188 flowgates reported for Bus 235707. If the user also desired to review the evaluation results offline, the results can be exported to an Excel output file identical to what is produced in the tabular application.

Evaluation Results

01WYLIE R 500 KV (235703) Remove Bus Export [XLS]

Search in all columns

| Transmission Facility | Contingency Type | Available (MW) | DFax | Impact (MW) | Pre-Loading (%) | Post-Loading (%) |
|---|------------------|----------------|-------|-------------|-----------------|------------------|
| 239092 02SAMMIS 345 253902 15BVRVAL 345 S1 | Breaker | 71 | 0.097 | 9.7 | 94.02 | 94.83 |
| 235105 01DOUBS 500 200003 BRIGHTON 500 1 | Breaker | 278 | 0.059 | 5.9 | 91.02 | 91.21 |
| 923061 AB1-105 TAP 345 238781 02HANNA 345 1 | Single | 148 | 0.031 | 3.1 | 89.54 | 89.76 |
| 238796 02HGLND 345 923061 AB1-105 TAP 345 1 | Tower | 323 | 0.043 | 4.3 | 81.49 | 81.74 |
| 253902 15BVRVAL 345 238941 02MANSFD 345 2 | Breaker | 326 | 0.052 | 5.2 | 81.25 | 81.55 |
| 923061 AB1-105 TAP 345 238781 02HANNA 345 1 | Bus | 332 | 0.034 | 3.4 | 80.95 | 81.15 |
| 253902 15BVRVAL 345 238941 02MANSFD 345 1 | Breaker | 333 | 0.052 | 5.2 | 80.87 | 81.17 |
| 242931 05BEVERL 345 242940 05MUSKNG 345 1 | Tower | 194 | 0.033 | 3.3 | 80.03 | 80.37 |
| 238941 02MANSFD 345 253936 15CRESCN 345 1 | Tower | 311 | 0.021 | 2.1 | 77.98 | 78.13 |
| 238781 02HANNA 345 238850 02JUNIFE 345 1 | Breaker | 447 | 0.038 | 3.8 | 76.35 | 76.55 |

Showing 1 to 10 of 152 rows
 < 1 2 3 4 5 ... >

Close

The evaluation presents the following results:

- Facilities will be impacted by a 100 MW solar unit injecting at the “01WYLIE R 500 kV (235703)” bus. For this example, we will ignore flowgates based on operational contingencies since they highlight potential congestion and we will focus just on single, breaker, bus and tower contingency flowgates.
- Facility “239092 02SAMMIS 345 253902 15BVRVAL 345 S1” with a breaker contingency has a pre-loading (%) of 94.02%. With the new 100 MW solar unit loading into the facility, post-loading (%) becomes 94.83% and the generator is imparting a 9.7 MW impact on the facility based on the DFax or the Distribution Factor.

The default sorting of the results is based on the pre-loading percentage (largest to smallest). However, the user can adjust the sorting to be based on the post-loading percentage from largest to smallest to view the facility-loading impacts from the desired generator.

| ng | Available (MW) | DFax | Impact (MW) | Impact (%) | Pre-Loading (%)▲ | Post-Loading (%) |
|----|----------------|-------|-------------|------------|------------------|------------------|
| 3 | 16 | 0.031 | 3.1 | 0.22 | 98.89 | 99.11 |
| 5 | 139 | 0.046 | 4.6 | 0.13 | 96.08 | 96.21 |
| 5 | 71 | 0.097 | 9.7 | 0.81 | 94.02 | 94.83 |

To download an Excel file, select the XLS button next to **Export** and agree to the disclaimer in order to download the results. Once the results are downloaded, there will be a separate tab generated for each POI bus in the evaluation. This feature is identical to the export feature in the tabular application.

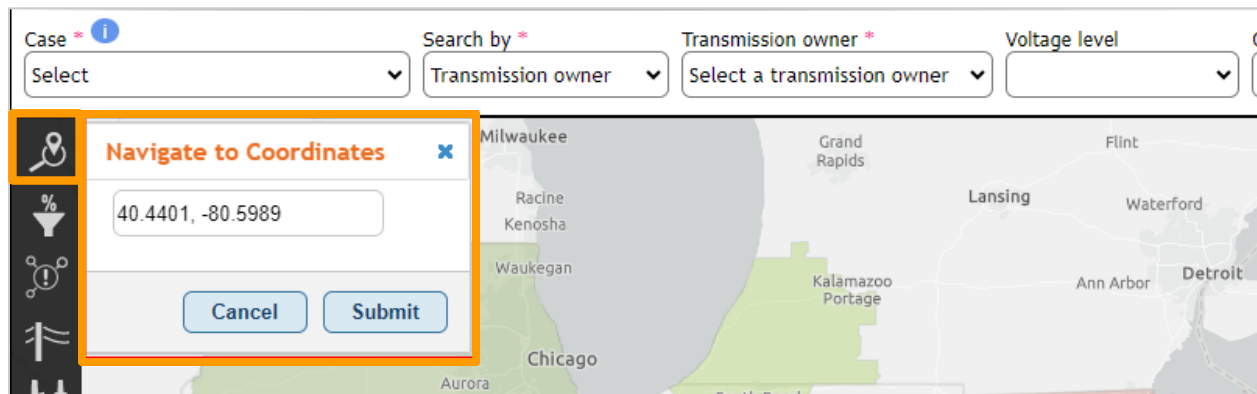
| User acknowledges that User has read, understands and agrees that User is bound by the terms of the Queue Scope Disclaimer Notice | | | | | | | | | | | |
|---|-----------------------------------|--|--|--|--|--|--|--|--|--|--|
| Case | 2024 AG1 Queue Case (Summer Peak) | | | | | | | | | | |
| Case last updated | 11/29/2022 21:35 | | | | | | | | | | |
| Transmission owner | AP | | | | | | | | | | |
| Voltage level | 500 kV | | | | | | | | | | |
| Operating mode | Injection | | | | | | | | | | |
| Desired MW | 100 | | | | | | | | | | |
| POI Bus Name | 01WYLIE R 500 KV (235703) | | | | | | | | | | |

| Transmission Facility | Contingency Name | Contingency Type | Rating | Available (MW) | DFax | Impact (MW) | Impact (%) | Pre-Loading (%) | Post-Loading (%) |
|--|--------------------------------|------------------|---------|----------------|-------|-------------|------------|-----------------|------------------|
| 923061 AB1-105 TAP 345 238781 02HANNA 345 1 | Base Case | Operational | 1,413.0 | 16 | 0.031 | 3.10 | 0.22 | 98.89 | 99.11 |
| 243206 05DUMONT 765 270644 WILTON ; 765 1 | Base Case | Operational | 3,555.0 | 139 | 0.046 | 4.60 | 0.13 | 96.08 | 96.21 |
| 239092 02SAMMIS 345 253902 15BVRVAL 345 S1 | DLC_P23_BV_GEN_1_3_SB | Breaker | 1,195.0 | 71 | 0.097 | 9.70 | 0.81 | 94.02 | 94.83 |
| 235105 01DOUBS 500 200003 BRIGHTON 500 1 | PEPCO_P5_8PEPCO | Breaker | 3,098.0 | 278 | 0.059 | 5.90 | 0.19 | 91.02 | 91.21 |
| 923061 AB1-105 TAP 345 238781 02HANNA 345 1 | Base Case | Single | 1,413.0 | 148 | 0.031 | 3.10 | 0.22 | 89.54 | 89.76 |
| 238796 02HGLND 345 923061 AB1-105 TAP 345 1 | ATSI-P7-1-OEC-345-034T | Tower | 1,743.0 | 323 | 0.043 | 4.30 | 0.25 | 81.49 | 81.74 |
| 253902 15BVRVAL 345 238941 02MANSFD 345 2 | DLC_P23_BV_320_5_SB | Breaker | 1,739.0 | 326 | 0.052 | 5.20 | 0.30 | 81.25 | 81.55 |
| 923061 AB1-105 TAP 345 238781 02HANNA 345 1 | ATSI-P2-2-OEE-138-007 | Bus | 1,743.0 | 332 | 0.034 | 3.40 | 0.20 | 80.95 | 81.15 |
| 253902 15BVRVAL 345 238941 02MANSFD 345 1 | DLC_P23_BV_320_6_SB | Breaker | 1,739.0 | 333 | 0.052 | 5.20 | 0.30 | 80.87 | 81.17 |
| 242931 05BEVERL 345 242940 05MUSKNG 345 1 | AEP_P7-1_#10944 | Tower | 971.0 | 194 | 0.033 | 3.30 | 0.34 | 80.03 | 80.37 |
| 238941 02MANSFD 345 253936 15CRESCN 345 1 | DLC_P71_314_318 | Tower | 1,411.0 | 311 | 0.021 | 2.10 | 0.15 | 77.98 | 78.13 |
| 238781 02HANNA 345 238850 02JUNIP 345 1 | ATSI-P2-3-OEC-345-020 | Breaker | 1,892.0 | 447 | 0.038 | 3.80 | 0.20 | 76.35 | 76.55 |
| 242931 05BEVERL 345 242940 05MUSKNG 345 1 | AEP_P2-1_246751 05VASSEL 765 2 | Single | 971.0 | 231 | 0.043 | 4.30 | 0.44 | 76.22 | 76.66 |
| 240069 02LORDSTOWN 345 238796 02HGLND 345 1 | ATSI-P1-2-OEE-345-881 | Single | 1,743.0 | 416 | 0.030 | 3.00 | 0.17 | 76.11 | 76.28 |
| 240069 02LORDSTOWN 345 238796 02HGLND 345 2 | ATSI-P1-2-OEE-345-879 | Single | 1,743.0 | 420 | 0.030 | 3.00 | 0.17 | 75.91 | 76.08 |
| 240069 02LORDSTOWN 345 238796 02HGLND 345 1 | ATSI-P1-2-OEE-345-881 | Operational | 1,743.0 | 427 | 0.030 | 3.00 | 0.17 | 75.48 | 75.65 |
| 240069 02LORDSTOWN 345 238796 02HGLND 345 2 | ATSI-P1-2-OEE-345-879 | Operational | 1,743.0 | 431 | 0.030 | 3.00 | 0.17 | 75.28 | 75.45 |
| 240069 02LORDSTOWN 345 238796 02HGLND 345 1 | ATSI-P2-3-OEE-345-007A | Breaker | 1,743.0 | 441 | 0.030 | 3.00 | 0.17 | 74.69 | 74.86 |
| 242931 05BEVERL 345 242940 05MUSKNG 345 1 | AEP_P4_#3056_05WATERFORD 345 | Breaker | 971.0 | 247 | 0.037 | 3.70 | 0.38 | 74.58 | 74.96 |
| 270162 AB2-067 TAP 765 246751 05VASSEL 765 1 | AEP_P1-2_#707_8315-A | Operational | 4,571.0 | 1,172 | 0.063 | 6.30 | 0.14 | 74.35 | 74.49 |
| 240069 02LORDSTOWN 345 238796 02HGLND 345 2 | ATSI-P2-3-OEE-345-005A | Breaker | 1,743.0 | 447 | 0.031 | 3.10 | 0.18 | 74.33 | 74.51 |
| 270162 AB2-067 TAP 765 246751 05VASSEL 765 1 | AEP_P4_#707_05MARYSV 765_B1 | Breaker | 4,571.0 | 1,175 | 0.063 | 6.30 | 0.14 | 74.30 | 74.44 |
| 238781 02HANNA 345 238850 02JUNIP 345 1 | ATSI-P1-2-OEC-345-813 | Operational | 1,892.0 | 491 | 0.038 | 3.80 | 0.20 | 74.04 | 74.24 |
| 238781 02HANNA 345 238615 02CHAMBR 345 1 | ATSI-P2-3-CEI-345-025_BDR_A | Breaker | 1,646.0 | 442 | 0.028 | 2.80 | 0.17 | 73.12 | 73.29 |
| 238796 02HGLND 345 923061 AB1-105 TAP 345 1 | Base Case | Operational | 1,413.0 | 384 | 0.031 | 3.10 | 0.22 | 72.81 | 73.03 |
| 235105 01DOUBS 500 200003 BRIGHTON 500 1 | PL:10:P23:100573 | Bus | 3,098.0 | 845 | 0.058 | 5.80 | 0.19 | 72.74 | 72.93 |
| 238781 02HANNA 345 238615 02CHAMBR 345 1 | ATSI-P1-2-CEI-345-714 | Operational | 1,646.0 | 470 | 0.030 | 3.00 | 0.18 | 71.43 | 71.61 |
| 235105 01DOUBS 500 200003 BRIGHTON 500 1 | PEPCO_P7_2PEPCO | Tower | 3,098.0 | 894 | 0.050 | 5.00 | 0.16 | 71.15 | 71.31 |

There are two additional alternatives to searching for substation/POI bus locations in the geospatial application. These are the “Navigate to Coordinates” feature and the “Search by” feature with “Bus name/Bus number selected.”

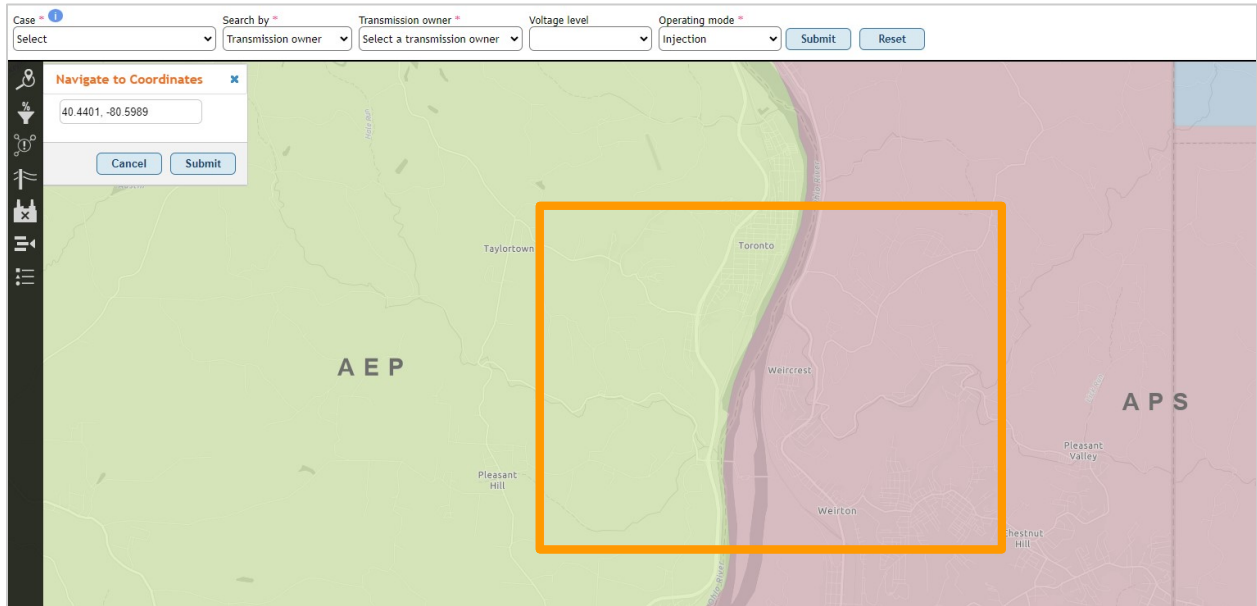
Navigate to Coordinates Feature

For this example the user selects the first alternative and utilizes the coordinate search function using a potential POI location near the existing Wylie Ridge substation: 40.4401, -80.5989.

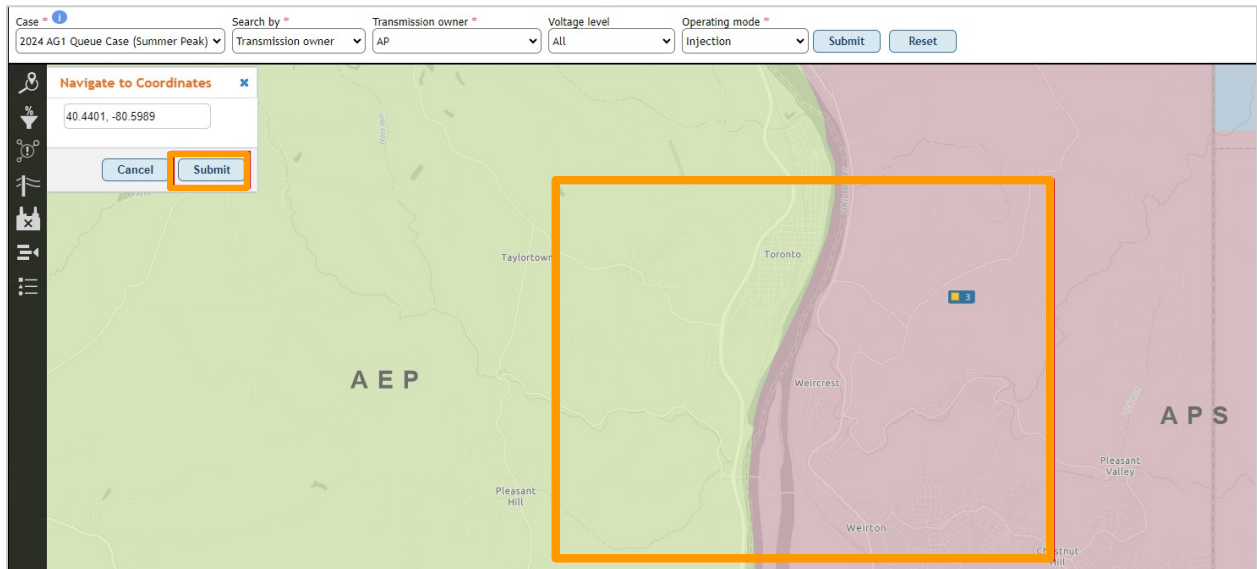


After clicking **Submit**, the application will pan to and zoom in on the grid coordinate location. Once the map is refreshed, the user can determine which transmission owner to load via the transmission owner drop-down with the “**Search by**” feature set to “Transmission owner” as shown below.

In this instance, the user selects AP (aka APS) to load the applicable substations/POI buses. When the user selects the transmission owner and continues with the remaining workflow and selects “**Submit**,” the map will automatically zoom out to the extent of the AP (aka APS) footprint with all of the substation symbols loaded.

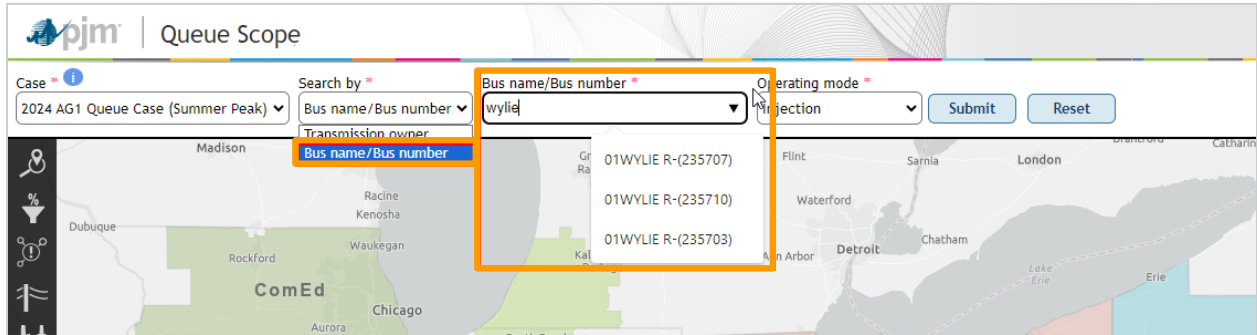


At this point the user can resubmit the coordinates entered in the “**Navigate to Coordinates**” feature in order to zoom back to the original location. Now the Wylie Ridge substation symbol is visible and can be selected by the user to run through the workflow already outlined above in order to generate evaluation results.

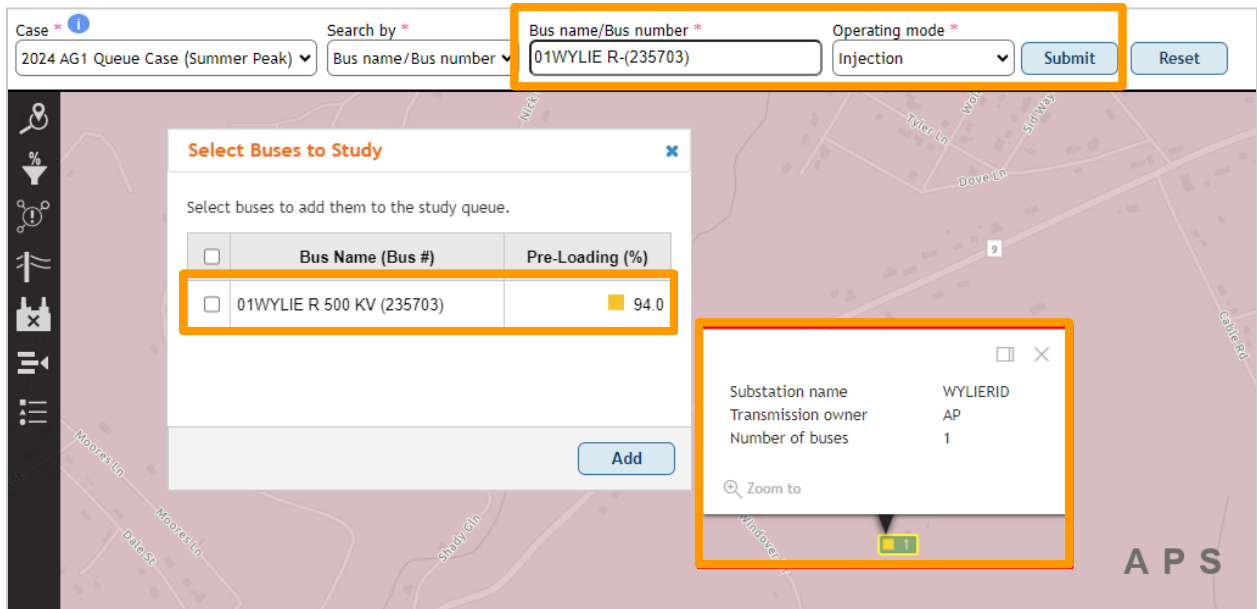


Search by Feature

The other alternative search feature is using the “Search by” drop-down with “Bus name/Bus number” selected. Once this is selected, the “Bus name/Bus number” field appears for the user to enter characters (numbers or letters) for the POI bus that the user intends to locate. In this case, the user is searching directly for buses at Wylie Ridge substation.



Once the user sees 01WYLIE R-(235703) appear in the list, the user can select the Bus name/Bus number and proceed through the rest of the workflow to locate the POI bus in the map. At this point, the user can select the substation window and only the 01WYLIE R 500 KV (235703) will be available for selection in running the analysis. This is a function of searching for a single Bus name/Bus number using this aspect of the Search by feature.




Section 7: Appendix 1 – Additional Examples (Tabular Application)

Example 1: 300 MW Natural Gas Generator Injection

In this example, the user wants to learn about the impact of a 300 MW natural gas unit injecting at a specific location on the PJM grid. After going through steps 1 to 3 in the previous sections, the following inputs are selected:

- Transmission owner: PENELEC
- Voltage level: 115 kV
- Operating mode: Injection
- Desired MW: 300 MW


Queue Scope

Evaluator

Case Selection

Case * i

2025 RTEP Base Case (Summer Peak) ▼

Case last updated

11/28/2022 20:15

Load Case Reset

Generator Connection

Transmission owner *
PENELEC ▼

Voltage level
115 kV ▼

Operating mode *
Injection ▼

Desired MW *
300

Points of interconnection * Maximum: 25

| Available Buses |
|----------------------------|
| 2631ST 115 kV (200879) |
| 26ALLEGHEN 115 kV (200745) |
| 26ARNOLD R 115 kV (200761) |
| 26BDFORD N 115 kV (200501) |
| 26BERKLY H 115 kV (200854) |
| 26BIGBY 115 kV (200881) |
| 26BIOEN TP 115 kV (200872) |
| 26BIOENRGY 115 kV (200873) |
| 26BLAIN 115 kV (200502) |
| 26BLRSVL E 115 kV (200740) |

1-10 of 150 records

>
>>
<
<<

| Selected Buses |
|-------------------|
| No records found. |
| 0-0 of 0 records |

Submit Reset

DISCLAIMER: User acknowledges that User has read, understands and agrees that User is bound by the terms of the Queue Scope Disclaimer Notice.

The user selects the “Warren South 200580” bus then moves the selected bus “26WARREN S 115 kV (200580)” to the selected buses accumulator by clicking on the **right arrow button** as shown below:

Then the user can click on **Submit** to generate the evaluation results.

After clicking **Submit**, the evaluation results should appear as shown below:

Evaluation Results

26WARREN S 115 kV (200580) Export: [XLS](#)

| Transmission Facility | Contingency Type | Available (MW) | DFax | Impact (MW) | Pre-Loading (%) | Post-Loading (%) |
|--|------------------|----------------|-------|-------------|-----------------|------------------|
| 200674 26TOWANDA 115 200677 26NO MESHO 115 1 | Breaker | 0 | 0.040 | 12.00 | 111.67 | 116.57 |
| 200675 26E.TWANDA 230 200924 26CANYON 230 1 | Breaker | 0 | 0.078 | 23.40 | 107.31 | 111.11 |
| 200675 26E.TWANDA 230 200924 26CANYON 230 1 | Tower | 4 | 0.079 | 23.70 | 99.41 | 103.26 |
| 200675 26E.TWANDA 230 200924 26CANYON 230 1 | Single | 7 | 0.078 | 23.40 | 98.83 | 102.63 |
| 200675 26E.TWANDA 230 200924 26CANYON 230 1 | Bus | 11 | 0.080 | 24.00 | 98.23 | 102.13 |
| 200924 26CANYON 230 200706 26N.MESHPN 230 1 | Breaker | 15 | 0.078 | 23.40 | 97.73 | 101.24 |
| 208009 LACK 230 200074 LACKAWANNA 500 3 | Breaker | 27 | 0.056 | 16.80 | 97.70 | 99.14 |
| 200675 26E.TWANDA 230 200924 26CANYON 230 1 | Single | 13 | 0.079 | 23.70 | 97.56 | 102.16 |
| 200674 26TOWANDA 115 200677 26NO MESHO 115 1 | Single | 13 | 0.040 | 12.00 | 94.83 | 99.73 |
| 200008 HOSENSACK 500 200007 ELROY 500 1 | Breaker | 286 | 0.048 | 14.40 | 90.80 | 91.26 |
| 200008 HOSENSACK 500 200007 ELROY 500 1 | Bus | 286 | 0.048 | 14.40 | 90.80 | 91.26 |

Example 2: 50 MW Battery Withdrawal (Charging) From Grid

In this example, the user wants to learn about the impact of a 50 MW battery/storage unit at specific location on the PJM grid. This example focuses on the analysis for the load component of the battery when charging from the grid.

After going through steps 1 to 3 in the previous sections, the following inputs are selected.

- Transmission Owner: AP (aka APS)
- Voltage level: 138 kV
- Operating Mode: Withdrawal
- Desired MW: 50 MW

Queue Scope

Evaluator

Case Selection

Case * i

2025 RTEP Base Case (Summer Peak) ▼

Case last updated

11/28/2022 20:15

Load Case

Reset

Generator Connection

Transmission owner *

AP ▼

Voltage level

138 kV ▼

Operating mode *

Withdrawal ▼

Desired MW *

50

Points of interconnection * Maximum: 25

Available Buses

|

- 01 106 J 138 kV (235305)
- 01 502JCT 138 kV (235113)
- 01AGA GA 138 kV (235308)
- 01AIRCO 138 kV (235288)
- 01AL 4 138 kV (235132)
- 01AL 4J 138 kV (235138)
- 01AL&D6T 138 kV (235139)
- 01ALBRIG 138 kV (235120)
- 01ALCAN 138 kV (235290)
- 01ALL L4T 138 kV (235825)

<< < 1-10 of 409 records > >>

>

>>

<

<<

Selected Buses

No records found.

<< < 0-0 of 0 records > >>

Submit

Reset

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36 | Page

The user searches and selects the “01HEATER 138 kV (235348)” bus as shown below. The user then moves the given bus “01HEATER 138 kV (235348)” to the selected buses accumulator by clicking on the right arrow button.

Generator Connection

Transmission owner * Voltage level Operating mode * Desired MW *

Points of interconnection * Maximum: 25

| Available Buses | | Selected Buses |
|-------------------------------------|----|----------------------------|
| <input type="text" value="235348"/> | > | <input type="text"/> |
| 01HEATER 138 kV (235348) | >> | No records found. |
| << < 1-1 of 1 records > >> | < | << < 0-0 of 0 records > >> |

The user can then click **Submit** to see evaluation results.

Points of interconnection * Maximum: 25

| Available Buses | | Selected Buses |
|--|----|----------------------------|
| <input type="text" value="235348"/> | > | <input type="text"/> |
| No records found. | >> | 01HEATER 138 kV (235348) |
| << < 0-0 of 0 records > >> | < | << < 1-1 of 1 records > >> |
| <input type="button" value="Submit"/> <input type="button" value="Reset"/> | | |

After clicking **Submit**, the evaluation results should appear as shown below:

Evaluation Results

01HEATER 138 kV (235348) Export: [XLS](#)

| Transmission Facility | Contingency Type | Available (MW) | DFax | Impact (MW) | Pre-Loading (%) | Post-Loading (%) |
|--|------------------|----------------|--------|-------------|-----------------|------------------|
| 242538 05AMOS_6_XFL 138 242537 05AMOS 138 1 | Breaker | 52 | -0.073 | 3.65 | 93.02 | 93.51 |
| 235334 01GLENFL 138 235380 01OAKMND 138 1 | Breaker | 36 | -0.052 | 2.60 | 89.16 | 89.94 |
| 235334 01GLENFL 138 235380 01OAKMND 138 1 | Bus | 36 | -0.052 | 2.60 | 89.15 | 89.93 |
| 247068 05KANAWH_ASZ 138 242689 05KANAWHA1 138 ZU | Single | 44 | -0.154 | 7.70 | 87.09 | 89.37 |
| 247092 05KANAWH_BSZ 138 242689 05KANAWHA1 138 ZL | Breaker | 53 | -0.126 | 6.30 | 85.53 | 87.24 |
| 242522 05AMOS 345 242537 05AMOS 138 7 | Breaker | 116 | -0.054 | 2.70 | 83.27 | 83.66 |
| 242537 05AMOS 138 247091 05LAKEVI 138 1 | Tower | 52 | -0.043 | 2.15 | 82.32 | 83.05 |
| 247091 05LAKEVI 138 242836 05TURNER1 138 1 | Tower | 52 | -0.043 | 2.15 | 82.32 | 83.05 |
| 235376 01NETTIE 138 235318 01CRUPRN 138 1 | Breaker | 39 | -0.176 | 8.80 | 79.82 | 84.40 |
| 247092 05KANAWH_BSZ 138 242689 05KANAWHA1 138 ZL | Single | 74 | -0.154 | 7.70 | 79.76 | 81.85 |
| 237509 01LEADSVILLE 138 235362 01LOUGHL 138 1 | Breaker | 44 | -0.101 | 5.05 | 79.27 | 81.64 |
| 235376 01NETTIE 138 235318 01CRUPRN 138 1 | Bus | 41 | -0.121 | 6.05 | 78.64 | 81.79 |
| 237509 01LEADSVILLE 138 235362 01LOUGHL 138 1 | Tower | 46 | -0.206 | 10.30 | 78.23 | 83.07 |
| 235111 01 502 J 500 235113 01 502JCT 138 2 | Bus | 128 | -0.027 | 1.35 | 77.92 | 78.15 |
| 235111 01 502 J 500 235113 01 502JCT 138 2 | Breaker | 128 | -0.027 | 1.35 | 77.92 | 78.15 |

Records Per Page: << < 1-15 of 219 records > >>

Example 3: 1,000 MW MTX Injection

In this example, the user wants to learn about the impact of a 1,000 MW Merchant Transmission (MTX) Injection at a specific location on the PJM grid. After going through steps 1 to 3 in the previous sections, the following inputs are selected:

- Transmission owner: DVP Dominion
- Voltage level: 500 kV
- Operating mode: Injection
- Desired MW: 1,000 MW

Queue Scope

Evaluator

Case Selection

Case * i

2025 RTEP Base Case (Summer Peak) ▼

Load Case

Reset

Case last updated

11/28/2022 20:15

Generator Connection

| | | | |
|--|---|--|--|
| Transmission owner * | Voltage level | Operating mode * | Desired MW * |
| <div style="border: 1px solid #ccc; padding: 2px; display: flex; align-items: center;">DVP ▼</div> | <div style="border: 1px solid #ccc; padding: 2px; display: flex; align-items: center;">500 kV ▼</div> | <div style="border: 1px solid #ccc; padding: 2px; display: flex; align-items: center;">Injection ▼</div> | <div style="border: 1px solid #ccc; padding: 2px; display: flex; align-items: center;">1,000</div> |

Points of interconnection * Maximum: 25

| | | | | | | | | | | | | |
|---|--------------------------|--------------------------|-----------------------------|--------------------------|----------------------------|-------------------------|-------------------------|--------------------------|--------------------------|-------------------------|---|---|
| <div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Available Buses</div> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">8BATH CO 500 kV (314901)</td></tr> <tr><td style="padding: 2px;">8BISMARK 500 kV (314941)</td></tr> <tr><td style="padding: 2px;">8BRAMBLETON 500 kV (314933)</td></tr> <tr><td style="padding: 2px;">8BRISTER 500 kV (314900)</td></tr> <tr><td style="padding: 2px;">8BRUNSWICK 500 kV (314945)</td></tr> <tr><td style="padding: 2px;">8CARSON 500 kV (314902)</td></tr> <tr><td style="padding: 2px;">8CHANCE 500 kV (314905)</td></tr> <tr><td style="padding: 2px;">8CHCKAHM 500 kV (314903)</td></tr> <tr><td style="padding: 2px;">8CLIFTON 500 kV (314904)</td></tr> <tr><td style="padding: 2px;">8CLOVER 500 kV (314906)</td></tr> </table> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 5px;"> << < 1-10 of 55 records > >> </div> | 8BATH CO 500 kV (314901) | 8BISMARK 500 kV (314941) | 8BRAMBLETON 500 kV (314933) | 8BRISTER 500 kV (314900) | 8BRUNSWICK 500 kV (314945) | 8CARSON 500 kV (314902) | 8CHANCE 500 kV (314905) | 8CHCKAHM 500 kV (314903) | 8CLIFTON 500 kV (314904) | 8CLOVER 500 kV (314906) | <div style="margin-bottom: 5px;">></div> <div style="margin-bottom: 5px;">>></div> <div style="margin-bottom: 5px;"><</div> <div style="margin-bottom: 5px;"><<</div> | <div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Selected Buses</div> <p style="margin: 0;">No records found.</p> <div style="display: flex; justify-content: center; align-items: center; margin-top: 5px;"> << < 0-0 of 0 records > >> </div> |
| 8BATH CO 500 kV (314901) | | | | | | | | | | | | |
| 8BISMARK 500 kV (314941) | | | | | | | | | | | | |
| 8BRAMBLETON 500 kV (314933) | | | | | | | | | | | | |
| 8BRISTER 500 kV (314900) | | | | | | | | | | | | |
| 8BRUNSWICK 500 kV (314945) | | | | | | | | | | | | |
| 8CARSON 500 kV (314902) | | | | | | | | | | | | |
| 8CHANCE 500 kV (314905) | | | | | | | | | | | | |
| 8CHCKAHM 500 kV (314903) | | | | | | | | | | | | |
| 8CLIFTON 500 kV (314904) | | | | | | | | | | | | |
| 8CLOVER 500 kV (314906) | | | | | | | | | | | | |

Submit

Reset

DISCLAIMER: User acknowledges that User has read, understands and agrees that User is bound by the terms of the Queue Scope Disclaimer Notice.

The user searches and selects the “8SUFFOLK 500 kV (314928)” bus as shown below. The user then moves the given bus “8SUFFOLK 500 kV (314928)” to the selected buses accumulator by clicking on the right arrow button.

Generator Connection

Transmission owner * Voltage level Operating mode * Desired MW *

Points of interconnection * Maximum: 25

| Available Buses | | Selected Buses |
|-------------------------------------|-----------------|----------------------------|
| <input type="text" value="314928"/> | > | <input type="text"/> |
| 8SUFFOLK 500 kV (314928) | >> | No records found. |
| << < 1-1 of 1 records > >> | < | << < 0-0 of 0 records > >> |

The user can then click **Submit** to see the evaluation results.

Points of interconnection * Maximum: 25

| Available Buses | | Selected Buses |
|---|-----------------|----------------------------|
| <input type="text" value="314928"/> | > | <input type="text"/> |
| No records found. | >> | 8SUFFOLK 500 kV (314928) |
| << < 0-0 of 0 records > >> | < | << < 1-1 of 1 records > >> |
| <div style="display: flex; justify-content: center; gap: 20px;"> <div style="border: 2px solid orange; padding: 5px;">Submit</div> <div>Reset</div> </div> | | |

After clicking **Submit**, the evaluation results should appear as shown below:

Evaluation Results

8SUFFOLK 500 kV (314928) Export: [XLS](#)

| Transmission Facility | Contingency Type | Available (MW) | DFax | Impact (MW) | Pre-Loading (%) | Post-Loading (%) |
|--|------------------|----------------|-------|-------------|-----------------|------------------|
| 314269 6PRGEORG 230 314291 3PRGEORG 115 1 | Tower | 0 | 0.020 | 20.00 | 100.91 | 110.01 |
| 314902 8CARSON 500 314282 6CARSON 230 1 | Breaker | 0 | 0.058 | 58.00 | 100.90 | 106.48 |
| 314908 8ELMONT 500 314911 8LADYSMITH 500 1 | Single | 0 | 0.312 | 312.00 | 100.49 | 113.27 |
| 314282 6CARSON 230 314285 6CHRL249 230 1 | Breaker | 9 | 0.032 | 32.00 | 98.67 | 103.35 |
| 314282 6CARSON 230 314285 6CHRL249 230 1 | Single | 20 | 0.020 | 20.00 | 96.50 | 100.08 |
| 314285 6CHRL249 230 314316 6LOCKS 230 1 | Breaker | 30 | 0.032 | 32.00 | 95.58 | 100.26 |
| 314285 6CHRL249 230 314316 6LOCKS 230 1 | Single | 41 | 0.020 | 20.00 | 92.73 | 96.31 |
| 314303 6HOPEWLL 230 314286 6CHESTF A 230 1 | Breaker | 48 | 0.059 | 59.00 | 91.33 | 102.08 |
| 314085 6REMNGCT 230 314110 6ELK RUN 230 1 | Single | 89 | 0.025 | 25.00 | 90.99 | 93.53 |
| 314110 6ELK RUN 230 314037 6GAINSVL 230 1 | Single | 93 | 0.025 | 25.00 | 90.56 | 93.10 |
| 314911 8LADYSMITH 500 314922 8POSSUM 500 1 | Single | 307 | 0.165 | 165.00 | 87.41 | 94.17 |
| 314134 6CRANES 230 314142 6STAFORD 230 1 | Single | 86 | 0.053 | 53.00 | 87.35 | 95.16 |
| 314747 6BREMO 230 314744 3BREMO 115 1 | Single | 40 | 0.027 | 27.00 | 85.32 | 95.33 |
| 314303 6HOPEWLL 230 314286 6CHESTF A 230 1 | Single | 73 | 0.057 | 57.00 | 83.79 | 96.48 |
| 314902 8CARSON 500 314282 6CARSON 230 1 | Single | 154 | 0.078 | 78.00 | 82.97 | 91.60 |

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Section 8: Frequently Asked Questions

Q1. What are the DFax values shown in the list of evaluation results?

A1. The DFax values (Generator Distribution Factor or the Generation Shift Factor) represent the change (or sensitivity) of active power flow in a reference direction on a transmission line with respect to a change in injection at the generator bus and a corresponding change in withdrawal at the reference system.

The DFax values change when:

- Transmission topology changes (such as Line outage, rebuild, generator addition or load changes)
- Line impedance changes

Q2. How are the Tool data sets (case study results) updated?

A2. The data sets will only be updated when a new case is available or when an existing case has a significant change in topology or generation.

Q3. Does the Tool show PJM case information updated in real time?

A3. The most recent Queue/RTEP models and inputs available will be used when updating the data sets (case study results).

Q4. What is the purpose of the Queue case selection?

A4. A Queue case results use a Queue study case created by the PJM Interconnection Analysis Department, which contains all active queue/cycle projects (mix of high and low commercial probability projects). This is a worst-case scenario with all active generation modeled that can load into transmission facilities. Grid congestion in these results will likely be high due to the queue volume.

Q5. What is the purpose of the RTEP Case selection?

A5. The RTEP Case selection uses the RTEP base case from Transmission Planning, which only contains existing generators and queue/cycle project generators that have a signed interconnection agreement (high commercial probability projects). This case will typically have results that align more with the Transmission Planning five-year RTEP study.

Q6. Why are contingency names not shown in the tool?

A6. Only the secure content version of the tool (with CEII data provisioned) displays the contingency name. This additional data field can be provisioned to your user account if you submit the request and are approved. Fill out the [form](#) to make a request.

Q7. Should I enter a negative MW value if I select the “Withdrawal” operating mode?

A7. No, the selection of the Withdrawal mode, which is generally used for Withdrawal applications, applies to projects with a load component (such as battery charging from the grid, pumped hydro and Merchant Transmission Projects) impact on the grid. The withdrawal impacts are automatically calculated based on the MW amount entered by the user.

Q8. How do I know what some of the POI Bus numbers and abbreviations mean?

A8. The POI bus numbers are specific to the bus numbers in the PSSE study case for the PJM network. The bus names can also be full names or abbreviations of substations or transmission taps within the PJM network. An access request can be submitted through Account Manager for access to the PJM System Maps wherein full names of substations and locations can be accessed by the user.

Q9. How do I assess a generator in the tool if it connects on a lower voltage network not modeled by PJM or provided in the POI bus list?

A9. The nearest 100 kV bus can be selected to provide an estimation of results. Ultimately, the user needs to know which transmission bus (>100 kV) the generator will likely inject into.

Q10. How do you evaluate MWC and MWE?

A10. The tool isn't currently set up to evaluate the capacity and energy component of a generator together. It is based more on an MFO assessment. The user does have the ability to enter a MWC (Capacity) or MWE (Energy) value, but the impacts are based on a variety of factors listed in Manual 14b. These factors are beyond the scope of this tool.

Q11. Why are Short Circuit, Voltage and Stability Analysis not evaluated in the Tool?

A11. The typical constraints on the PJM grid are directly driven by thermal violations and the associated network upgrades to mitigate those violations. These other types of analysis are still critical but do not typically present the largest barrier to interconnecting on the PJM grid. The above-mentioned studies are also time-consuming and data intensive, and they could involve commingling data sets from different software other than PowerGem GenDeliv.

Q12. Why are possible network upgrades and associated costs not provided in the Tool for the overloaded facilities presented in the evaluation results table?

A12. These may be possible in a future version of the Tool, but it is beyond the scope of the Tool at this time. There is [publicly available information](#) on PJM.com to indicate what baseline, supplemental or network upgrades are active on the PJM system.

Q13. Why doesn't PJM consistently update the case results based on retools, etc.?

A13. The study process to generate the results for this Tool is very different from PJM's typical interconnection studies and requires modifications to the GenDeliv study settings and the case files. It is a large effort outside of the normal interconnection studies process to generate and maintain these data sets for the Tool. These results are estimates and informational only, so they will not have the precision of a formal interconnection study for an active queue/cycle project that has paid to enter the PJM interconnection process.

Q14. Why does it appear that some of the data for some queues/new service requests or generator deactivations in the geospatial Tool are not current/accurate?

A14. The data for these items are only refreshed on a scheduled recurring basis and not dynamically updated like some pages on PJM.com with current new service request and generator deactivation data. Generally there should be minimal lag in refreshed data being available in the tool.

Q15. Are the POI buses available for selection also guaranteed to support future generator interconnections?

A15. No, the POI buses available for selection do not provide clarity on whether a project can physically interconnect the transmission system at the desired location. These existing bus locations in the PJM footprint are intended to provide the user with an estimate of grid impacts in the area and at the various voltage levels based on the injection or withdrawal of MWs.

Q16. Is the congestion overlay a representation of market-based grid congestion or is it just related to thermal impacts seen on the system based on the Generator Deliverability Test?

A16. The congestion overlay is merely a visual representation of the most severe thermal facility impacts by POI as seen in the results coming from the Generator Deliverability test. This overlay is not related to the market-based definition of grid congestion based on energy prices as defined in the following statement: Heavy use of the electricity grid can result in congestion – a condition where the lowest-priced electricity can't flow freely to a specific area – and higher-priced power is needed to keep the lights on. Queue Scope just provides a visual representation of the results that a user will see when running a POI evaluation in the tool.

Q17. What data is used to support rendering of the congestion overlay when it is available for viewing within the geospatial application?

A17. This overlay is rendered based on the pre-loading (%) for the most heavily loaded flowgate at each POI bus across the PJM footprint. Only single, breaker, bus and tower con flowgates are considered in this visualization. Operational con flowgates are ignored. When this overlay is initially loaded, there is a slight delay since these results are being visualized in the map for 6,000+ POI buses.

Section 9: Additional Questions

Any additional questions regarding this guide or the Queue Scope application should be directed to Member Relations at (866) 400-8980 or custsvc@pjm.com.

Section 10: Terms & Acronyms

The following terms and acronyms are specific to this project and any supporting programs or functions within PJM.

| Term/Acronym | Definition |
|--------------|--|
| CEII | Critical Energy Infrastructure Information |
| Con | Contingency |
| DFax | Distribution Factor |
| FG or FGT | Flowgate |
| GenDeliv | Generation Deliverability |
| GIS | Geographic Information System |
| IA | Interconnection Analysis |
| IC | Interconnection Customer |
| IPA | Interconnection Planning Analysis |
| ISO | Independent System Operator |
| kV | Kilovolt |
| MFO | Max Facility Output |
| Mon | Monitor |
| MTX | Merchant Transmission |
| MVA | Megavolt-ampere |
| MW | Megawatt |
| MWC | MW Capacity |
| MWE | MW Energy |
| POI | Point of Interconnection |
| PSSE | Power System Simulator for Engineering (Siemens PTI) |
| RTEP | Regional Transmission Expansion Plan |
| RTO | Regional Transmission Organization |
| TARA | Transmission Adequacy & Reliability Assessment (PowerGem software) |
| UI | User Interface |

Section 11: Revision History

| Date | Rev | Changes |
|------------|-----|--|
| 12/01/2022 | 0 | Initial Issue |
| 12/29/2022 | 1 | Updated language and references in Section 1 for User Access and CEII Data requests |
| 12/18/2023 | 2 | Updated introduction and sections 1,2,3 and 8 and added section 6 to include content for the release of the new Geospatial Application |
| | | |