

Voltage Limits

eDART Forum – Transmission
01/14/2020

New eDART web-based functionality to allow Transmission Owners (TOs) to update and view current voltage limits on buses.

- Available via the TERM Main Menu.
- TOs submit changes to Voltage Limits: company defaults or per station/voltage combination with effective date.
- PJM approves changes to Voltage Limits.
- Tickets implemented in PJM's EMS by PJM or implemented without approval if limits already updated in PJM's EMS.
- Report for PJM & TOs to see effective voltage limits and PJM defaults.

- Initial Voltage Limits in eDART will be populated with data in PJM Manual 03.
- New stations will be assigned the company default limits as part of the model build.
- eDART Voltage Limits only includes companies and stations with PJM monitored equipment:
 - MP1: Reliability & Markets
 - MP2: Reliability BES
 - MP6: Reliability non-BES

- Company
 - Voltage Limits per Voltage level.
 - Company Voltage Limits will be applied to all Stations in the company per voltage level.
 - Station tickets can be created for exceptions.
 - Not needed if following PJM Defaults.
- Station
 - Voltage Limits per Station per Voltage level
 - Note needed if following Company defaults.

- Submitted
 - Ticket has been submitted to PJM
- Received
 - Acknowledgement that PJM received the ticket
 - Changes to Received ticket will result in status change to Submitted
- Approved
 - Ticket has been reviewed, accepted as valid & approved by PJM

- Implemented
 - Data from approved ticket has been reconciled in PJM EMS
 - Actual Start Date confirms that ticket is in use by EMS
- Implemented w/o Approval
 - Data from non-approved ticket has been reconciled in PJM EMS
 - Ticket was automatically generated based on PJM EMS data
 - Actual Start Date confirms that ticket is in use by PJM EMS
- Cancelled by Company/PJM Admin Closure
 - Ticket can be cancelled by PJM or TO for various reasons

- Restored
 - Company ticket status for restoring company limits to PJM Defaults
- Restored w/o approval
 - Station ticket status when station limits from PJM EMS matches company limits
- Completed
 - The ticket is completed due to a new implemented ticket
 - Actual End Date confirms that ticket is no longer in use by PJM EMS

- Retired
 - Ticket is for station that has been retired or company that is longer a part of Voltage Limits
 - PJM is no longer monitoring company or station

Yellow

- Indicates that Voltage Limit of current level is different from Voltage Limit of the next level up.
 - Company limit is different from PJM Default.
 - Station limit is different from Company default limit.

Red

- Indicates that Station Voltage Limit is different from Company default limit but the same as PJM Default.

TERM Main Menu

Create New Ticket View/Revise Tickets Effective Ratings
Bulk Upload Historical Bulk Report

TERM Reports

Status Reports Recently Restored History Report
Expiring Temp. Tickets Unrated Facilities Equip. Historical Change Log

Submitted Tickets
Submitted: 79/136 Revised: 10/24 Received: 22/70

Approved Tickets
(Temporary) Approved: 5/3 Implemented: 0/0
(Permanent) Approved: 5/3 Implemented: 2358/2409

Base Data

Adjust R, X, B Adj. Tariff Data R, X, B Adjust Report
Adj. Tariff Data Report

R, X, B Adjustment **Monitored Status**
Submitted: 0/2 Submitted: 0

Voltage Limits

Create New Ticket View/Revise Tickets Effective Limits
Implemented w/o Approval **Late Tickets** Back to PJM Defaults
PJM Default Limits Overview Report

Notification Reports

Ack. Required Notifications Report Notifications Request Form

Current Notifications: 2646

Red buttons indicate attention required



- To create a company limits ticket, select Voltage and leave station as **** ALL **** .
 - Adj. limits is prepopulated with Initial Company limits; user can edit fields as needed
- To follow PJM defaults, check the Follow PJM Defaults box.

New Voltage Limits Ticket

Ticket ID: New Company: Voltage: 138 KV Station: **** ALL ****

Est. Start: Follow PJM Defaults: Ticket Status: Submitted

Date (MM/DD/YYYY)

Comments:

PJM Comments:

	Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop Warning (%)	Voltage Drop Limit (%)
	Low	High	Low	High			
Initial PJM	131.1	144.9	127.0	144.9	124.2	5.0	10.0
Initial Company	135.0	144.9	131.0	144.9	128.0	3.5	7.0
Adj. Limits	135.0	144.9	131.0	144.9	128.0	3.5	7.0

Submit Form
Main Menu

- To create a station limits ticket, select Voltage and station.
 - Adj. limits is prepopulated with Initial Station limit; user can edit fields as needed
- To follow Company Limits, check the Follow Company Limits box.

New Voltage Limits Ticket

Ticket ID: New Company: Voltage: 138 KV Station: 1811288

Est. Start: Follow Company Limits: Ticket Status: Submitted

Date (MM/DD/YYYY)

Comments:

PJM Comments:

	Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop Warning (%)	Voltage Drop Limit (%)
	Low	High	Low	High			
Initial PJM	131.1	144.9	127.0	144.9	124.2	5.0	10.0
Initial Company	135.0	144.9	131.0	144.9	128.0	3.5	7.0
Initial Station	135.0	144.9	131.0	144.9	128.0	3.5	7.0
Adj. Limits	135.0	144.9	131.0	144.9	128.0	3.5	7.0

Submit Form
Main Menu

Voltage Limits View/Revise Reports Filter			
Company	Voltage	Station	Voltage Limits Type
	<input type="text"/>	<input type="text"/>	<input type="text"/>
Ticket Status	Current/Historical	Revert to PJM / Company Level Only	Late Only
<ul style="list-style-type: none"> Approved Cancelled by Company Completed Denied Implemented Implemented w/o Approval PJM Admin Closure Received Restored Restored w/o Approval Retired 	<input checked="" type="radio"/> Current <input type="radio"/> Historical <input type="radio"/> Both Ticket ID: <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tickets Occurring (mm/dd/yyyy)	Start Date (mm/dd/yyyy)	End Date (mm/dd/yyyy)	Limit Details
From: <input type="text"/> To: <input type="text"/>	From: <input type="text"/> To: <input type="text"/>	From: <input type="text"/> To: <input type="text"/>	<input checked="" type="radio"/> Adj. <input type="radio"/> Adj. + Initial <input type="radio"/> Adj. + Initial + Curr.

Apply Filter
Refresh
Main Menu

Select how much details will be displayed

Voltage Limits View/Revise

Ticket ID	Company	Voltage	Station	Voltage Limits Type	Status	Revert to PJM or Company level	Est. Start	Act. Start	Act. End	Limits							
										Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit	
	Low	High	Low	High													
2816		69 KV		Company	Implemented	No	12/13/2019	12/13/2019									
										PJM Default Initial	65.6	72.5	63.5	72.5	62.1	5.0	10.0
										Company Initial	65.6	72.5	63.5	72.5	62.1	5.0	10.0
										Adj.	67.5	72.5	65.5	72.5	63.5	3.5	7.0
2868		69 KV	APPLE	Station	Implemented w/o Approval	No	12/18/2019	12/18/2019									
										PJM Default Initial	65.6	72.5	63.5	72.5	62.1	5.0	10.0
										Company Initial	67.5	72.5	65.5	72.5	63.5	3.5	7.0
										Station Initial	67.5	72.5	65.5	72.5	63.5	3.5	7.0
Adj.	67.5	72.5	65.5	72.5	63.5	5.0	9.0										
2867		69 KV	ORANGE	Station	Restored w/o Approval	Yes	12/18/2019										
										PJM Default Initial	65.6	72.5	63.5	72.5	62.1	5.0	10.0
										Company Initial	67.5	72.5	65.5	72.5	63.5	3.5	7.0
										Station Initial	68.5	73.5	66.5	73.5	64.5	4.5	8.0
Adj.	67.5	72.5	65.5	72.5	63.5	3.5	7.0										

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Voltage Limits Ticket

Ticket ID: 2868 **Company:** **Voltage:** 69 KV **Station:** APPLE

Est. Start: 12/18/2019 **Est. Implementation:** Follow Company Limits: **Ticket Status:** Implemented w/o Approval ▼

Actual Start: 12/18/2019 **Actual End:**

Comments:

Automatically created due to EMS data.

PJM Comments:

Automatically created due to EMS data.

	Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop Warning (%)	Voltage Drop Limit (%)
	Low	High	Low	High			
Initial PJM	65.6	72.5	63.5	72.5	62.1	5.0	10.0
Initial Company	67.5	72.5	65.5	72.5	63.5	3.5	7.0
Initial Station	67.5	72.5	65.5	72.5	63.5	3.5	7.0
Adj. Limits	67.5	72.5	65.5	72.5	63.5	5.0	9.0
Current PJM	65.6	72.5	63.5	72.5	62.1	5.0	10.0
Current Company	67.5	72.5	65.5	72.5	63.5	3.5	7.0
Current Station	67.5	72.5	65.5	72.5	63.5	5.0	9.0

History Log

Back to Report

Main Menu

Log of ticket status changes

- Report of Voltage Limits effective on selected dates
- TOs can view effective limits of other TOs.
- Report types
 - All
 - Follow PJM Defaults
 - Not Following PJM Defaults
 - Exceptions
 - Non-Exceptions
 - Overview Report : Company Version of Manual 03 Report

Defaults to user's company
User can pick other TOs from the Company list

Effective Voltage Limits			
Company	Voltage	Station	Voltage Limits Type
Company			
Eff. Date (mm/dd/yyyy)	Sort by	Report type	
	<input checked="" type="radio"/> Comp./Voltage <input type="radio"/> Voltage/Comp.	All	
Apply Filter Refresh Main Menu			

Defaults to today if left blank

Check to display all stations
- stations following company limits are hidden by default

Check to display all limit levels
- if limits match only the lowest level is displayed by default

Effective Voltage Limits for 01/13/2020 (All)																
<input type="checkbox"/> Show Duplicates <input type="checkbox"/> Show Details																
Equip ID	Company	Voltage	Station	Voltage Limits Type	Follow PJM Default	Eff. Date	Term. Date	Limits					Action			
								Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit		
								Low	High	Low	High					
102682	Company	500 KV		Company	Yes	12/13/2019		Company	500.0	550.0	485.0	550.0	475.0	2.5	5.0	
102673	Company	69 KV		Company	No	12/13/2019		Company	67.5	72.5	65.5	72.5	63.5	3.5	7.0	Revert to PJM Defaults
102787	Company	69 KV	APPLE	Station	No	12/13/2019		Station	67.5	72.5	65.5	72.5	63.5	5.0	9.0	Revert to Company Limits

Download CSV export of the report

Click on the Action to open a new, prepopulated ticket

Report of tickets in Implemented w/o Approval and Restored w/o Approval status.

Voltage Limits View/Revise																
Ticket ID	Company	Voltage	Station	Voltage Limits Type	Status	Revert to PJM or Company level	Est. Start	Act. Start	Act. End	Limits						
2868	PECO Energy Company	69 KV	APPLE	Station	Implemented w/o Approval	No	12/18/2019	12/18/2019		Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit
										Low	High	Low	High			
										Adj.	67.5	72.5	65.5	72.5	63.5	5.0
2867	PECO Energy Company	69 KV	ORANGE	Station	Restored w/o Approval	Yes	12/18/2019			Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit
										Low	High	Low	High			
										Adj.	67.5	72.5	65.5	72.5	63.5	3.5

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Tickets that have not been implemented and the Est. Start date is in the past.

Voltage Limits View/Revise																																																																														
Ticket ID	Company	Voltage	Station	Voltage Limits Type	Status	Revert to PJM or Company level	Est. Start	Act. Start	Act. End	Limits																																																																				
2873		138 KV	PINEAPPL	Station	Submitted	No	01/11/2020			<table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">Normal (KV)</th> <th colspan="2">Emergency (KV)</th> <th rowspan="2">Load Dump</th> <th rowspan="2">Voltage Drop (%) Warning</th> <th rowspan="2">Voltage Drop (%) Limit</th> </tr> <tr> <th>Low</th> <th>High</th> <th>Low</th> <th>High</th> </tr> </thead> <tbody> <tr> <td>PJM Default Initial</td> <td>131.1</td> <td>144.9</td> <td>127.0</td> <td>144.9</td> <td>124.2</td> <td>5.0</td> <td>10.0</td> </tr> <tr> <td>Company Initial</td> <td>135.0</td> <td>144.9</td> <td>131.0</td> <td>144.9</td> <td>128.0</td> <td>3.5</td> <td>7.0</td> </tr> <tr> <td>Station Initial</td> <td>135.0</td> <td>144.9</td> <td>131.0</td> <td>144.9</td> <td>128.0</td> <td>3.5</td> <td>7.0</td> </tr> <tr> <td>Adj.</td> <td>135.0</td> <td>144.9</td> <td>131.0</td> <td>144.9</td> <td>127.0</td> <td>3.5</td> <td>7.0</td> </tr> <tr> <td>PJM Default Current</td> <td>131.1</td> <td>144.9</td> <td>127.0</td> <td>144.9</td> <td>124.2</td> <td>5.0</td> <td>10.0</td> </tr> <tr> <td>Company Current</td> <td>135.0</td> <td>144.9</td> <td>131.0</td> <td>144.9</td> <td>128.0</td> <td>3.5</td> <td>7.0</td> </tr> <tr> <td>Station Current</td> <td>135.0</td> <td>144.9</td> <td>131.0</td> <td>144.9</td> <td>128.0</td> <td>3.5</td> <td>7.0</td> </tr> </tbody> </table>		Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit	Low	High	Low	High	PJM Default Initial	131.1	144.9	127.0	144.9	124.2	5.0	10.0	Company Initial	135.0	144.9	131.0	144.9	128.0	3.5	7.0	Station Initial	135.0	144.9	131.0	144.9	128.0	3.5	7.0	Adj.	135.0	144.9	131.0	144.9	127.0	3.5	7.0	PJM Default Current	131.1	144.9	127.0	144.9	124.2	5.0	10.0	Company Current	135.0	144.9	131.0	144.9	128.0	3.5	7.0	Station Current	135.0	144.9	131.0	144.9	128.0	3.5	7.0
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2869		138 KV	DRAGONFR	Station	Submitted	No	01/10/2020			<table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">Normal (KV)</th> <th colspan="2">Emergency (KV)</th> <th rowspan="2">Load Dump</th> <th rowspan="2">Voltage Drop (%) Warning</th> <th rowspan="2">Voltage Drop (%) Limit</th> </tr> <tr> <th>Low</th> <th>High</th> <th>Low</th> <th>High</th> </tr> </thead> <tbody> <tr> <td>PJM Default Initial</td> <td>131.1</td> <td>144.9</td> <td>127.0</td> <td>144.9</td> <td>124.2</td> <td>5.0</td> <td>10.0</td> </tr> <tr> <td>Company Initial</td> <td>135.0</td> <td>144.9</td> <td>131.0</td> <td>144.9</td> <td>128.0</td> <td>3.5</td> <td>7.0</td> </tr> <tr> <td>Station Initial</td> <td>135.0</td> <td>144.9</td> <td>131.0</td> <td>144.9</td> <td>128.0</td> <td>3.5</td> <td>7.0</td> </tr> <tr> <td>Adj.</td> <td>135.0</td> <td>144.9</td> <td>134.0</td> <td>144.9</td> <td>128.0</td> <td>3.5</td> <td>7.0</td> </tr> <tr> <td>PJM Default Current</td> <td>131.1</td> <td>144.9</td> <td>127.0</td> <td>144.9</td> <td>124.2</td> <td>5.0</td> <td>10.0</td> </tr> <tr> <td>Company Current</td> <td>135.0</td> <td>144.9</td> <td>131.0</td> <td>144.9</td> <td>128.0</td> <td>3.5</td> <td>7.0</td> </tr> <tr> <td>Station Current</td> <td>135.0</td> <td>144.9</td> <td>131.0</td> <td>144.9</td> <td>128.0</td> <td>3.5</td> <td>7.0</td> </tr> </tbody> </table>		Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit	Low	High	Low	High	PJM Default Initial	131.1	144.9	127.0	144.9	124.2	5.0	10.0	Company Initial	135.0	144.9	131.0	144.9	128.0	3.5	7.0	Station Initial	135.0	144.9	131.0	144.9	128.0	3.5	7.0	Adj.	135.0	144.9	134.0	144.9	128.0	3.5	7.0	PJM Default Current	131.1	144.9	127.0	144.9	124.2	5.0	10.0	Company Current	135.0	144.9	131.0	144.9	128.0	3.5	7.0	Station Current	135.0	144.9	131.0	144.9	128.0	3.5	7.0
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Report of Company tickets created to follow PJM Default.

Voltage Limits View/Revise

Ticket ID	Company	Voltage	Station	Voltage Limits Type	Status	Revert to PJM or Company level	Est. Start	Act. Start	Act. End	Limits							
										Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit	
		Low	High	Low	High												
2872		765 KV		Company	Submitted	Yes	01/12/2020										

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Report of Voltage Levels that PJM is monitoring and the corresponding PJM Default limits

PJM Default Voltage Limits									
User:		Company:		<input type="checkbox"/> Show Archived					
Voltage	Normal (KV)		Emergency (KV)		Load Dump (KV)	Voltage Drop Warning	Voltage Drop Limit	Delete/Archive	Last Modified
	Low	High	Low	High					
69 KV	65.6	72.5	63.5	72.5	62.1	5%	10%	<input type="checkbox"/>	11/12/2019 16:02
115 KV	109.3	120.8	105.8	120.8	103.5	5%	10%	<input type="checkbox"/>	11/12/2019 16:02
138 KV	131.1	144.9	127.0	144.9	124.2	5%	10%	<input type="checkbox"/>	11/12/2019 16:02
161 KV	153.0	169.1	148.1	169.1	144.9	5%	10%	<input type="checkbox"/>	11/12/2019 16:02
230 KV	218.5	241.5	211.6	241.5	207.0	5%	8%	<input type="checkbox"/>	11/12/2019 16:02
345 KV	327.8	362.3	317.4	362.3	310.5	5%	8%	<input type="checkbox"/>	11/12/2019 16:02
500 KV	500.0	550.0	485.0	550.0	475.0	2.5%	5%	<input type="checkbox"/>	11/12/2019 16:02
765 KV	726.8	803.3	703.8	803.3	688.5	5%	8%	<input type="checkbox"/>	11/12/2019 16:02

Check to display data that was deleted or archived by PJM

Company Version of PJM Manual 03 Report

230 KV:
Company is following PJM Default

138 KV:
Company is not following PJM Default

69kV:
Company is not following PJM Default
APPLE station is not following
Company Default

Effective Voltage Limits for 01/13/2020 (Overview Report)							
Voltage: 230 KV							
	Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit
	Low	High	Low	High			
PJM Default	500.0	550.0	485.0	550.0	475.0	2.5	5.0
Follow PJM Default Companies:							
Company							
Voltage: 138 KV							
	Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit
	Low	High	Low	High			
PJM Default	131.1	144.9	127.0	144.9	124.2	5.0	10.0
Company	135.0	144.9	131.0	144.9	128.0	3.5	7.0
Voltage: 69 KV							
	Normal (KV)		Emergency (KV)		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit
	Low	High	Low	High			
PJM Default	65.6	72.5	63.5	72.5	62.1	5.0	10.0
Company	67.5	72.5	65.5	72.5	63.5	3.5	7.0
Company Station: APPLE	67.5	72.5	65.5	72.5	63.5	5.0	9.0