

Voltage Limits

eDART Forum – Transmission 01/14/2020

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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



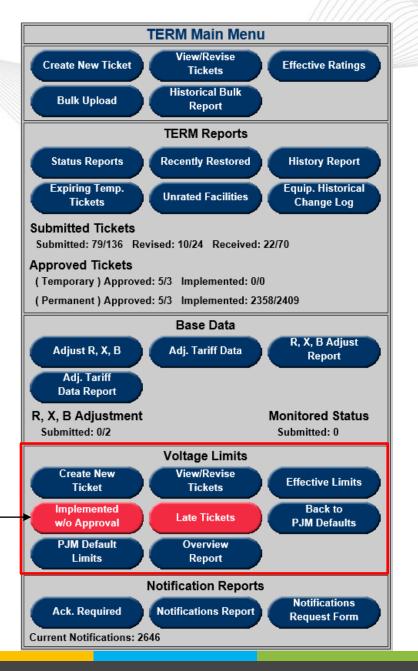
Yellow

- 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.





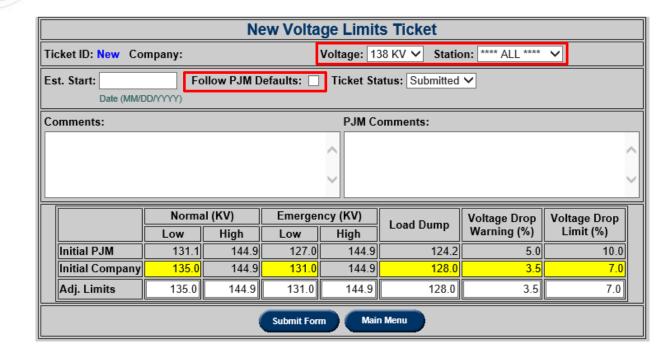
Main Menu

Red buttons indicate attention required





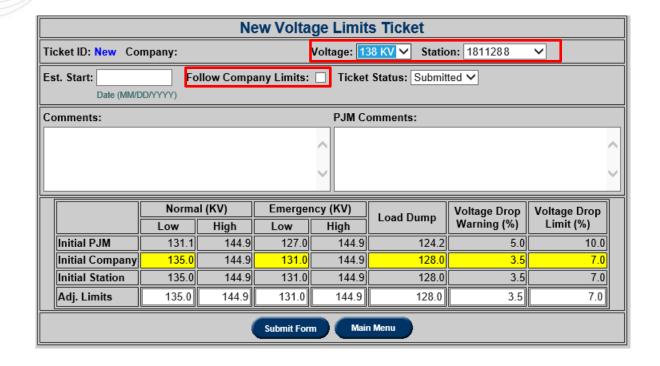
- To create a company limits ticket, select Voltage and leave station as **** ALL ****.
 - Adj. limits is prepopulated with Initial Company limits; user can edit fields as needed
- To follow PJM defaults, check the Follow PJM Defaults box.







- 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.





View/Revise Tickets

Voltage Limits View/Revise Reports Filter														
Company	Voltage	Station	Voltage Limits Type											
	<u> </u>	<u> </u>	<u> </u>											
Ticket Status	Current/Historical	Revert to PJM / Company Level Only	Late Only											
Approved Cancelled by Company Completed Denied Implemented Implemented w/o Approval PJM Admin Closure Received Restored Restored Retired	Current OHistorical OBoth Ticket ID:													
Tickets Occurring (mm/dd/yyyy)	Start Date (mm/dd/yyyy)	End Date (mm/dd/yyyy)	Limit Details											
From: To:	From: To:	From: To:	● Adj. ○ Adj. + Initial ○ Adj. + Initial + Curr.											
	Apply Filter	Refresh Main Menu												

Select how much details will be displayed

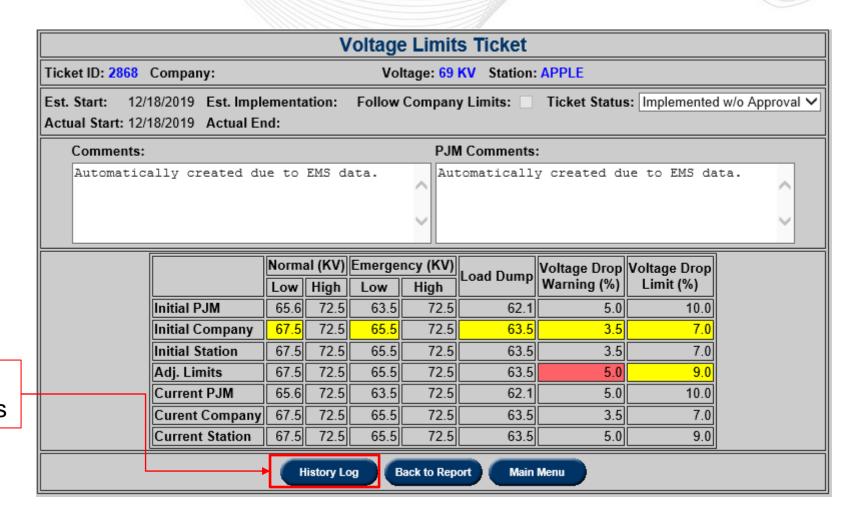


View/Revise Ticket

						Voltage L	imits Vi	ew/Revis	se												
Ticket ID	Company	Voltage	Station	Voltage Limits Type	Status	Revert to PJM or Company level	Eat Start	<u> </u>			Limits										
								12/13/2019			Norma		===	ncy (KV) High	Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit				
<u>2816</u>		69 KV		Company	Implemented					PJM Default Initial	65.6	72.5	63.5	72.5		5.0					
					Implemented w/o Approval					Company Initial Adj.	=	72.5 72.5		=		5.0 3.5	10.0				
																	Voltage Drop (%)				
				Station									Low	High	Load Dump	Warning	Limit				
2868		69 KV	APPLE							PJM Default Initial						5.0	10.0				
2000		00111		Claudii						Company Initial		72.5		72.5		3.5	7.0				
										Station Initial	_	72.5					7.0				
										Adj.							9.0				
															Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit				
										PJM Default Initial	Low			High 72.5	62.1	5.0					
<u>2867</u>		69 KV	ORANGE	Station	Restored w/o Approval	Yes	12/18/2019			Company Initial	67.5			72.5		3.5	7.0				
										Station Initial	68.5			73.5		4.5	8.0				
										Adj.	67.5		65.5	72.5	63.5	3.5	7.0				
					Ref	resh Downlo	oad Ba	ck to Filter	Main Me	enu											



View/Revise Ticket



Log of ticket status changes

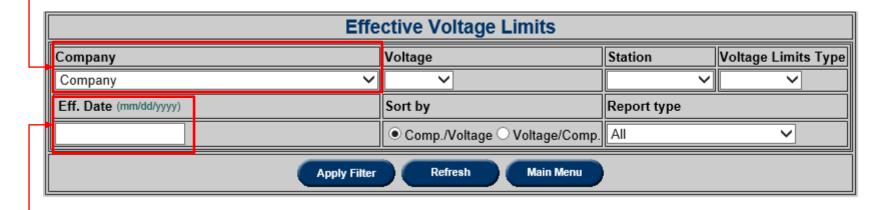


- Report of Voltage Limits effective on selected dates
- TOs can view effective limits of other TOs.
- Report types
 - All
 - Follow PJM Defaults
 - Not Following PJM Defaults
 - Exceptions
 - Non-Exceptions
 - Overview Report : Company Version of Manual 03 Report



Effective Limits

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



Defaults to today if left blank

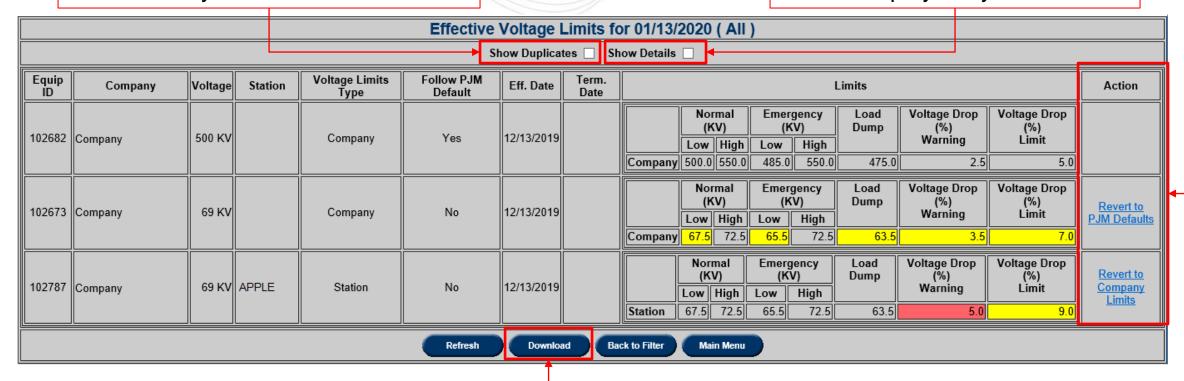


Effective Limits

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



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.

					V	oltage Limit	ts View/F	Revise								
Ticket ID	Company	Voltage	Station	Voltage Limits Type	Status	Revert to PJM or Company level		Act. Start	Act. End					Limits		
IIII ZANA II	PECO Energy Company	69 KV	APPLE		Implemented w/o Approval	No	12/18/2019	12/18/2019			Normal (KV) Low High	Emer (K Low		Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit
										Adj.	67.5 72.5	65.5	72.5	63.5	5.0	9.0
IIII /Xh/ II	PECO Energy Company	69 KV	ORANGE	Station	Restored w/o Approval	Yes	12/18/2019				Normal (KV) Low High	Emer (K Low	gency V) High	Load Dump	Voltage Drop (%) Warning	Voltage Drop (%) Limit
										Adj.	67.5 72.5	65.5	72.5	63.5	3.5	7.0
					Refresh	Download	Back to F	ilter Ma	in Menu							

Download CSV export of the report



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

						Volt	age Limi	ts View	//Revis	ie .												
Ticket ID	Company	Voltage	Station	Voltage Limits Type	Status	Revert to PJM or Company level	Est. Start	Act. Start	Act. End													
												mal (V)	Emer	gency V)	Load Dump	Voltage Drop (%)	Voltage Drop					
												High	Low	High		Warning	Limit					
										PJM Default Initial	_		127.0	144.9	124.2	5.0	10.0					
										Company Initial		144.9		144.9	128.0	3.5	7.0					
<u>2873</u>		138 KV	PINEAPPL	Station	Submitted	d No	01/11/2020			Station Initial		144.9	131.0	144.9	128.0	3.5						
										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						
										Company Current			131.0	144.9	128.0	3.5						
										Station Current	135.0	144.9	131.0	144.9	128.0	3.5	7.0					
					Submitted	No	01/10/2020					mal (V)	Emer	gency V)	Load Dump	Voltage Drop (%)	Voltage Drop (%)					
											Low	High	Low	High		Warning	Limit					
										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					
<u>2869</u>		138 KV	DRAGONFR	Station						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						
										Station Current	135.0	144.9	131.0	144.9	128.0	3.5	7.0					
			<u> </u>			Refresh	Download	Back t	o Filter	Main Menu												

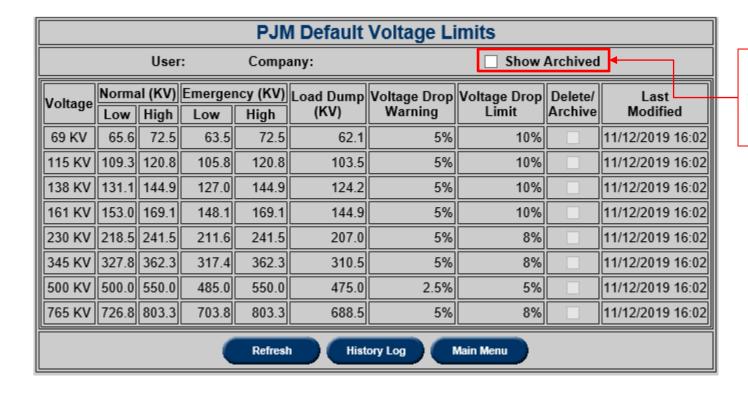


Report of Company tickets created to follow PJM Default.

						Volta	age Lim	its Viev	v/Revis	е										
Ticket ID	Company	Voltage	Station	Voltage Limits Type	Status	Revert to PJM or Company level	Est. Start	Act. Start	Act. End	d Limits										
											Norma	al (KV)	Emergen	icy (KV)	Load Dump		Voltage Drop (%)			
											Low	High	Low	High		Warning	Limit			
	765 8				Submitted	d Yes	01/12/2020			PJM Default Initial	726.8	803.3	703.8	803.3	688.5	5.0	8.0			
<u>2872</u>		765 KV		Company						Company Initial	726.8	803.3	703.8	803.3	688.5	5.0	10.0			
										Adj.	726.8	.8 803.3 703.8 803	803.3	688.5	5.0	8.0				
										PJM Default Current	726.8	803.3	703.8	803.3	688.5	5.0	8.0			
										Company Current	726.8	803.3	703.8	803.3	688.5	5.0	10.0			
								$\overline{}$												
						Refresh	Download	Back 1	o Filter	Main Menu										



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



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

