

TRANSMISSION EQUIPMENT RATINGS MONITOR TERM

www.pjm.com | Public PJM©2023



TRANSMISSION EQUIPMENT RATINGS MONITOR

TERM

- Is part of eDART functionality
- Supports equipment ratings changes
- Allows users to monitor equipment ratings
- Includes lines, transformers, series devices (reactors), phase shifters and flow breakers
- Uses Internet similar to other eDART functions
- Creates files formatted for PJM's Energy Management System (EMS)

TERM does not enter data directly into the EMS





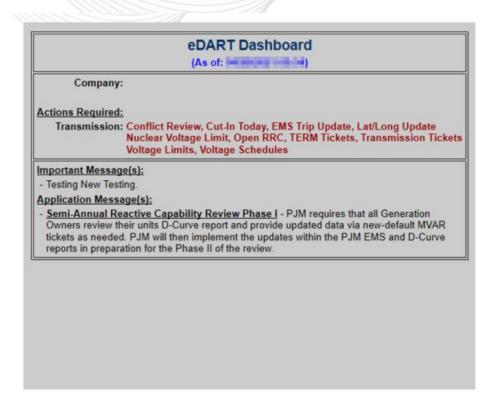
- Federal Energy Regulatory Commission (FERC) requires PJM to track/audit transmission rating changes
- Transmission Owners (TOs) can submit ratings data
- TOs can review ratings data
- PJM can review ratings data
- TERM application provides access to R,X,B Data, Voltage Limits, DLR Facilities and Notification Reports



l og on to		eDART
Log-on to		Please enter your User Name and Password
eDART		User Name:
		Password:
		Login Change Member Important Employee Registration Links Registration
	Warning:	This system and the information processed or contained within is for the use of authorized users only. At any time, and for any lawful purpose, PJM may monitor, intercept, record and search any communications or data transiting or stored on this information system, and may disclose such communications or data to the U.S Government and its authorized representatives. Anyone using this system expressly consents to the terms and conditions contained in this notice. Individuals using this computer system without authority, or in excess of their authority, are advised that if monitoring reveals possible improper or criminal activity, system personnel may provide the evidence of such monitoring to management or law enforcement officials for disciplinary proceedings and/or criminal and civil proceedings under local and foreign laws. Welcome to eDARTI
	Importanti	To access PJM Tools page please click <u>here</u> .
		To access the eDART page on PJM.com for eDART Training information please click here.
		To access the Tariff Facilities page on PJM.com please click here (requires PJM.com account).
		PJM - Contact Directory
	Appl. Messag	e: <u>Semi-Annual Reactive Capability Review</u>
		The 2nd phase of the review is in progress. PJM requests that Transmission Owners review updated D-Curve data in eDART by (a) reviewing MVAR tickets entered in their zones using the Transmission Owners Report; and (b) reviewing unit D-Curve data as currently modeled in the PJM EMS for units in their zones using the D-Curve Report.

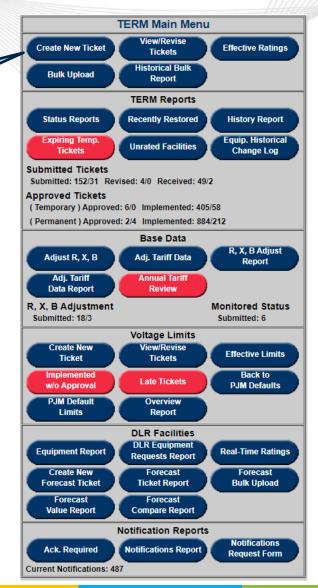




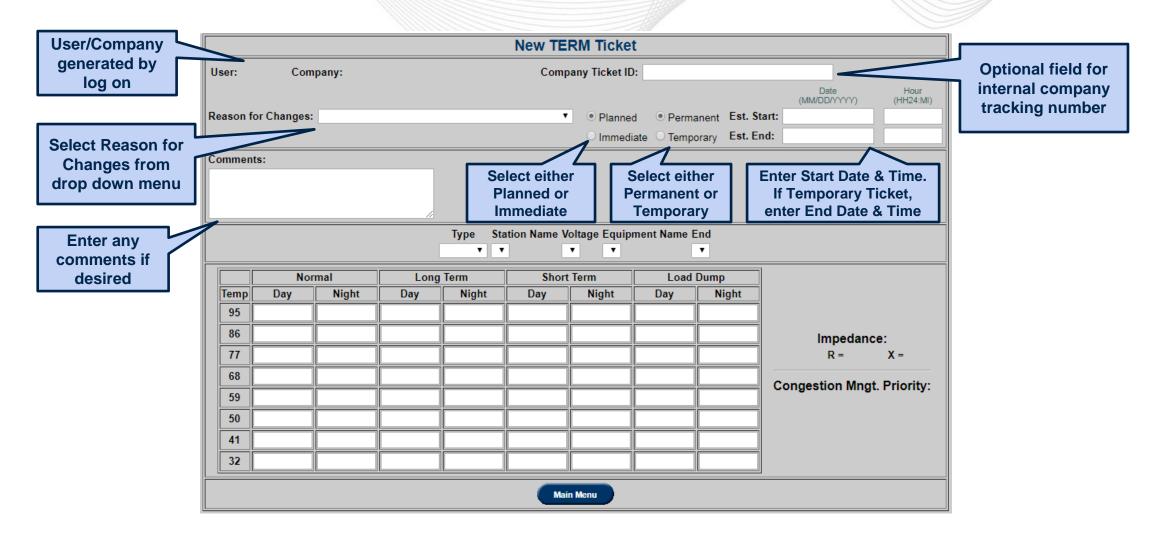




Click on Create New Ticket





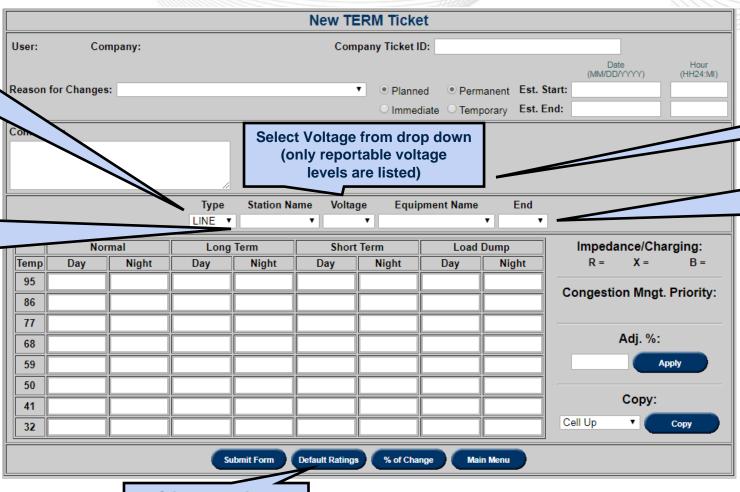


www.pjm.com | Public 7 PJM©2023



Select
LINE, TRANSFORMER,
SERIES DEVICE, PHASE
SHIFTER or CIRCUIT
BREAKER from drop down

Select Station Name from pull down (only station names from your company will appear in this drop down)



Select Equipment Name from drop down

Select End A or End B (use End A for internal lines. For tie-lines, select your End)

Note: For transformers drop down choices are either "High" or "Low"

Click to retrieve Default Ratings



	New TERM Ticket												
	User:	Con	npany:				Compan	y Ticket ID	:				
										Date Hour (MM/DD/YYYY) (HH24:MI)			
	Reason fo	or Changes	:				~	Planne		nanent Est. Start:			
								Olmmed	ate Temp	porary Est. End:			
	Comment	ts:									Resistance (R),		
											Reactance (X) and		
											Susceptance (B) values		
				Type S	tation Nam	ie Voltaç	ge _	Equipme	nt Name	End	for selected equipment		
Rating set for			LI	NE V			<u> </u>			✓ END A ✓	/		
selected equipment is	>		rmal		Term		t Term		Dump	Insura dan aa (Chaanian)			
now populated	Temp 95	Day 957	Night 957	Day	Night 1155	Day	Night 1155	1153	Night 1195	Impedance/Charging: R = 0.00032 X = 0.00411 B = 0.69726	Congestion		
	86	957	957	1138	1159	1138		1174	1195	Congestion Mngt. Priority:	Congestion Management Priority is		
	77	957	957	1158	1159	1158	1159	1194	1195	Reliability & Markets	displayed		
	68	957	957	1159	1159	1159	1159	1195	1195	Adj. %:			
	59	957	957	1159	1159	1159	1159	1195	1195	Apply			
	50	957	957	1159	1159	1159	1159	1195	1195	Сору:			
	41	957	957	1159	1159	1159		1195	1195	Cell Up ∨ Copy			
	32	957	957	1159	1159	1159	1159	1195	1195				
				C	ubmit Form	Default R	Ratings	% of Change	Main M	lenu			



Values in matrix can

be changed individually

Create a New TERM Ticket

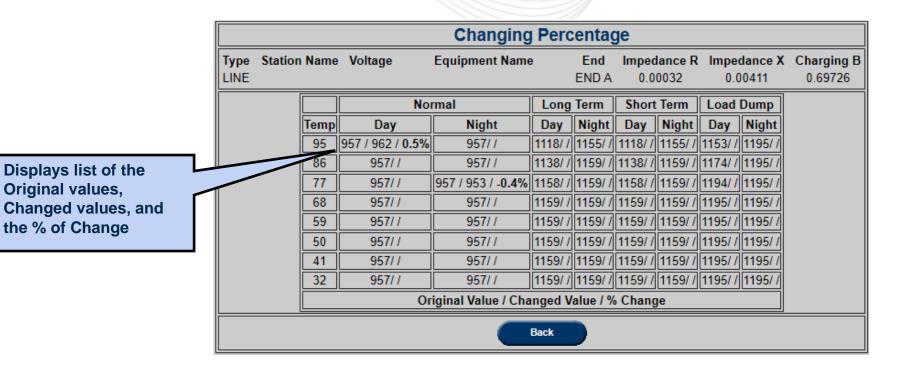
						Ne	w TERM	Ticket			
Use	New TERM Ticket User: Company: Company Ticket ID: Date (MM/DD/YYYY) (MH/24/MI)										
Rea	son fo	r Changes	:				~	Planne	ed		
								Olmmed	liate O Temp	porary Est. End:	
Con	nments	s:									
User: Company: Company Ticket ID: Data Hour											
				Type 5	Station Nam	ie Volta	iae	Equipme	ent Name	End	
				71						✓ END A ✓	
		No	rmal	Lon	g Term	Sho	rt Term	Load	d Dump		
	Company Comp										
	95	962	957	1118	1155	1118	1155	1153	1195		
	86	957	957	1138	1159	1138	1159	1174	1195		
	77	957	953	1158	1159	1158	1159	1194	1195		and then Submit Form
	68	957	957	1159	1159	1159	1159	1195	1195		
	=										
	50									Сору:	
	=									Cell Up ∨ Copy	
	32	957	957	1159	1159	1159	1159	1195	1195		cens, rows and columns
					Submit Form	Default	Ratings	6 of Change	Main M	enu	
								1			
					To view	comp	arison c	f new	ratings t	to old ratings and	
									_		

www.pjm.com | Public PJM©2023



Original values,

Create a New TERM Ticket



www.pjm.com | Public 11 PJM©2023



	New TERM Ticket													
Use	er:	Con	npany:				Company	y Ticket ID:						
										Date Hour (MM/DD/YYYY) (HH24:MI)				
Rea	son fo	r Changes	:				~	Planned Permanent Est. Start:						
								Olmmedi	ate O Temp	orary Est. End:				
Cor	nment	s:												
H				Type S	tation Name	e Voltag	 1e	Equipme	nt Name	End				
				NE Y			<u> </u>			✓ END A ✓				
		No	rmal	Long	Term	Short	t Term	Load	Dump					
	Temp		Night	Day	Night	Day	Night	Day	Night	Impedance/Charging:				
	95	962	957	1118	1155	1118	1155	1153	1195	R = 0.00032 X = 0.00411 B = 0.69726				
	86	957	957	1138	1159	1138	1159	1174	1195	Congestion Mngt. Priority: Reliability & Markets				
	77	957	953	1158	1159	1158	1159	1194	1195	Adj. %:				
	68	957	957	1159	1159	1159	1159	1195	1195	Apply				
	59	957	957	1159	1159	1159	1159	1195	1195					
	50	957	957	1159	1159	1159	1159	1195	1195	Copy:				
	41	957	957	1159	1159	1159	1159	1195	1195	Cell Up Copy				
	32	957	957	1159	1159	1159	1159	1195	1195					
				S	ubmit Form	Default R	atings 9	% of Change	Main M	enu				
			Clic	k on S	ubmit F	orm								



Limitation Submission

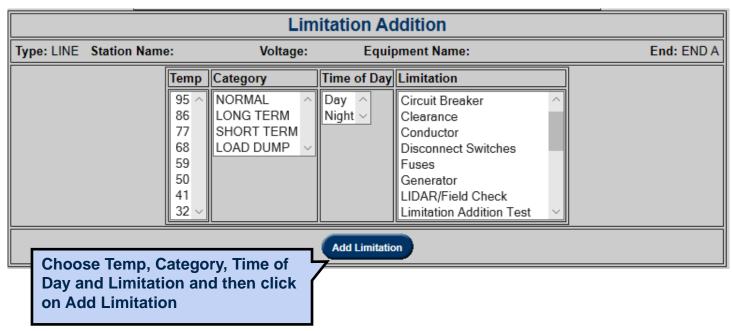
Warning message will be displayed if any business rule is violated

TERM Ticket Warning TERM ticket was created with following warning(s): Normal Day Value for 95 degrees is greater than Normal Day Value for 86.

Normal Day Value for 95 degrees is greater than Normal Day Value for 86.

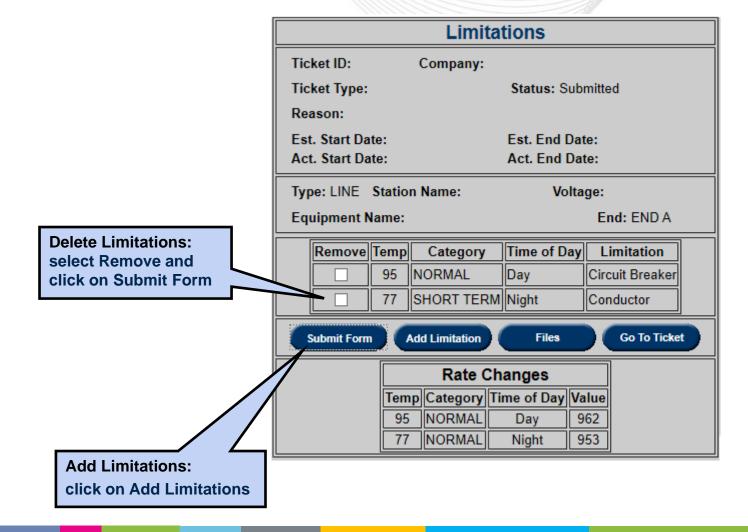
Normal Night Value for 86 degrees is greater than Normal Night Value for 77.

This warning list will not be saved, please print this page for your records.



- Limitations identify the specific equipment that restricts thermal capability. (e.g., disconnect switch, generator, fuses, etc.)
- Limitations can be submitted for each individual rating or for all Temps, Categories, Times of Day





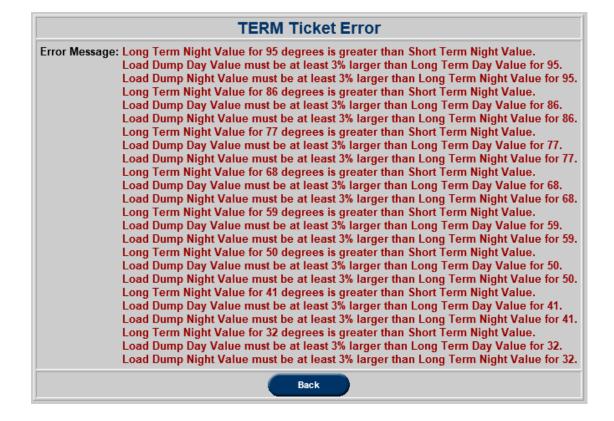
www.pjm.com | Public PJM©2023



Ticket Warnings

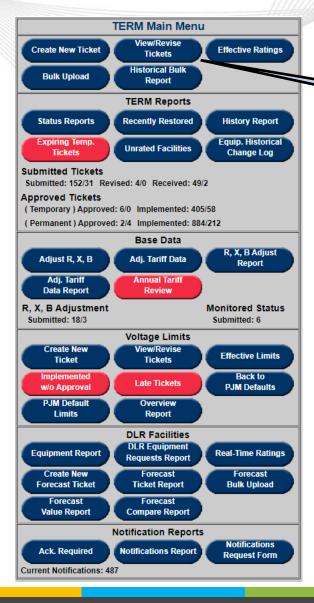
Warning messages will be displayed if any business rule is violated.

Example of Warning messages if a Load Dump value is less than 103% of Short Term value is shown below.





Revise an Existing Ticket



Click on View/Revise Tickets



Revise an Existing Ticket

				380F	
	Filter, s	ne View/Revise select desired criteria, and/o	Report		
		View/Re	evise Reports	Filter	
Company	Ticket ID	Company Ticket ID		Tickets/Notifications	Group Name
MERCHANISM COUNTY				Current	
Туре	Station Name	Voltage		Equipment Name	End
~	~	~		v	~
Temporary	Permanent	Planned		Immediate	Reason For Change
					~
Ticket Status	Tickets Occurring (mm/dd/yyyy)	Submittal Date (mm/dd/	уууу)	Implemented w/o Actual Start Date	
•	From: To:	From: 1	Го:		
		Apply Filter	Refresh	Main Menu	
			criteria sel	Apply Filter with no search ected will call up a report RM tickets in eDART	

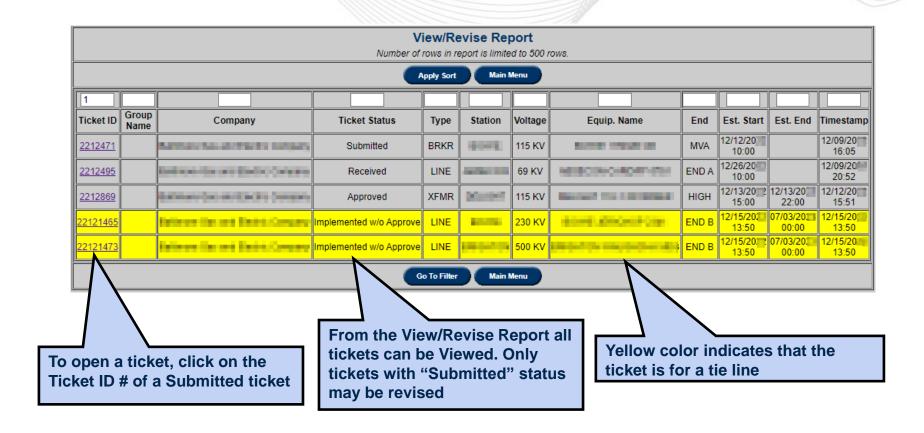


Tickets/Notifications

- □ Current includes tickets in non-final statuses (Submitted, Approved, Active, etc.) and recent (in the last 40 days since last status change) tickets in final statuses (Canceled, Restored, Denied, etc)
- ☐ Historical tickets in final statuses with status change more than 40 days ago
- Both includes both Current and Historical tickets
- Tickets TO-owned facility tickets
- Notifications Tickets for facilities where TO has "Y" Notification access (more information on Notification types)
- Shared Tickets tickets for equipment that TO is sharing with another TO



Revise an Existing Ticket

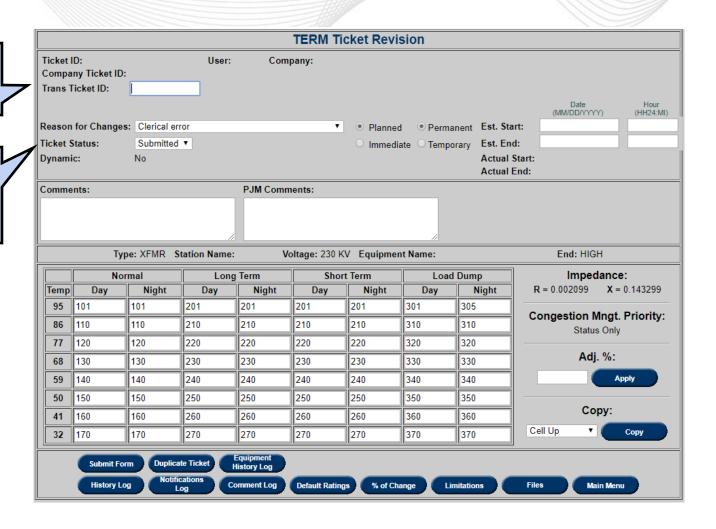




Revise an Existing Ticket

A user can enter Trans Ticket ID that is related to TERM ticket

TERM Ticket after initial submission has a Ticket Status field which provides the option to Cancel the ticket





TERM Ticket Status

□ Submitted

- Ticket has been submitted to PJM
- Only status that allows revisions to a ticket and will not alarm if it passes start date.

Revised

- Status of an existing ticket that has been modified

Received

- Acknowledgement that PJM received the ticket
- Applies to Submitted and Revised tickets

Approved

- Ticket has been reviewed, accepted as valid & approved by PJM

TERM Ticket Status

□ Implemented

- Data from ticket has been formatted for entry into the PJM EMS
- Actual Date and Time confirms that ticket was activated in EMS

Denied

- Ticket denied by PJM
- Failed sanity check &/or possible manipulation of the system

□ Cancelled

- Ticket can be cancelled by PJM or TO for various reasons

Restored

- Applies to Temporary tickets
- Limited to 30 day history
- Equipment limits return to default ratings



Revise an Existing Ticket

							TERM Tic	cket Revis	sion			
		Trans T Reason Ticket S Dynam	ny Ticket ID: Ficket ID: for Changes Status:	: Clerical err Submitted No	_		pany: ▼	Date (MM/DD/YYYY)				
		Comme			//	PJM Comm						
			Тур	e: XFMR St	ation Name:	V	oltage: 230 K	V Equipmen	t Name:		End: HIGH	
Make desired revisions	ı		Nor			Term		t Term		Dump	Impedance:	
to lower portion of	ı	Temp	Day	Night	Day	Night	Day	Night	Day	Night	R = 0.002099 X = 0.143299	
ticket for rating values	╢	95	101	101	201	201	201	201		305	Congestion Mngt. Priority:	
		86	110	110	210	210	210	210		310	Status Only	
	ı	77	120	120	220	220	220	220	320	320	A 41: 0/ .	
	ı	68	130	130	230	230	230	230	330	330	Adj. %:	
0 11 11	ı	59	140	140	240	240	240	240	340	340	Apply	
Continue to add	ı	50	150	150	250	250	250	250	350	350		
additional limitations if	ı	41	160	160	260	260	260	260	360	360	Сору:	
desired, or Click on	1	32	170	170	270	270	270	270	370	370	Cell Up ▼ Copy	
Submit Form		Z	Submit For	m Duplicat	e Ticket	Equipment listory Log						
			History Lo	Notific Lo		omment Log	Default Rating	s % of Cha	inge Lim	nitations	Files Main Menu	

Make desired revisions to upper portion of ticket



Warning message will be displayed if any business rule is

Yellow color indicates

rating is less than 3% higher than Long

(Refer to PJM Manual 03, Section 2.1.1.)

that Load Dump

Term rating.

violated.

Ticket Warning Example

					TERM	Ticket Re	vision			
	any Ticket ID	:	User:	Co	ompany:					
Trans	Ticket ID:								Date (MM/DD/YYY)	Hour (HH24:MI)
Reasor	n for Change	s: New equip	pment under (Congestion Ma	nagement	▼ ● Plan	ned Pe	rmanent	Est. Start:	
Ticket	Status:	Submitted	▼			O Imm	ediate Ter	mporary	Est. End:	
Dynam	ic:	No							Actual Start: Actual End:	
Comme	ents:			PJM Comn	nents:					
			/.							
	Warning This tid	g: Submitted ket will be s	ratings chan ubject to revi	ge violates P lew and may l	JM's rule of 3 be rejected. S	3% separatio See Manual 0	n between Lo 3 Section 2.1	ong Term I I.1 for mor	Emergency and Load Dump ratings re information on the requirements	s.
	Туј	pe: LINE Sta	ation Name:	Vol	tage: 230 KV	Equipment	t Name:		End: END A	
	Nor	mal	Long	Term	Short	t Term	Load	Dump	Impedance/Charg	ging:
Temp	Day	Night	Day	Night	Day	Night	Day	Night	R = 0.00068 X = 0.00815	B = 0.00182
95	671	696	809	830	809	830	809	830	Congestion Mngt. P	riority
86	682	708	821	842	821	842	821	842	Reliability & Marke	-
77	694	719	833	853	833	853	833	853	<u> </u>	
68	704	730	844	865	844	865	844	865	Adj. %:	
59	715	740	856	876	856	876	856	876	Appl	y
50	726	750	866	887	866	887	866	887		
41	737	761	877	896	877	896	877	896	Сору:	
32	748	772	887	907	887	907	887	907	Cell Up ▼ C	ору
		orm Dup	olicate Ticket	Equipment History Log						
	History	y Log No	otifications Log	Comment Log	Default Ra	tings % of	f Change	Limitations	s Files Main Menu	

www.pjm.com | Public 24 PJM©2023



Ticket Duplication

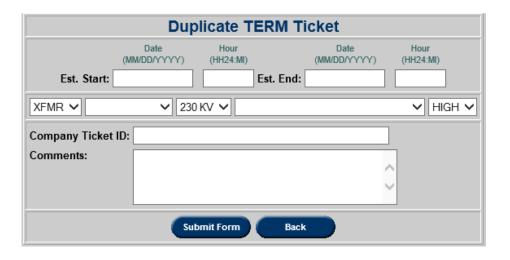
Type: XFMR Station Name: **Provides pre-populated** Long Term Normal Day Night Temp Day Night Day data entry when similar 95 101 101 201 201 201 circuit ratings and 86 110 110 210 210 210 limitations apply to 77 120 220 120 220 220 adjacent line segments 230 230 230 130 130 or identical 140 140 240 240 240 transformers 150 250 250 250 160 260 260 260

TERM Ticket Revision Ticket ID: User: Company: Company Ticket ID: Trans Ticket ID: Date (MM/DD/YYYY) (HH24:MI) Reason for Changes: Clerical error ▼ ● Planned ● Permanent Est. Start: Ticket Status: Submitted ▼ Immediate
 Temporary Dynamic: No **Actual Start:** Actual End: Comments: PJM Comments: Voltage: 230 KV Equipment Name: End: HIGH **Short Term** Load Dump Impedance: Night R = 0.002099 X = 0.143299Day Night 201 301 305 Congestion Mngt. Priority: 210 310 310 Status Only 220 320 320 Adj. %: 230 330 330 240 340 340 Apply 250 350 350 Copy: 260 360 360 Cell Up Copy 32 170 270 270 270 270 370 370 Equipment History Log **Duplicate Ticket Submit Form History Log** Comment Log Default Ratings % of Change Limitations Files Main Menu



Ticket Duplication

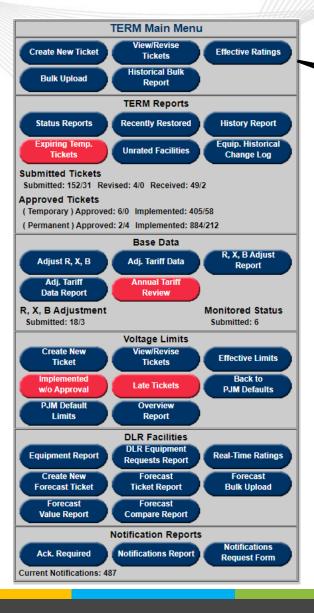
- Users must submit Start Date/Time for all tickets
- For Temporary Tickets, users must submit End Date/Time
- New ticket numbers and warnings will be displayed







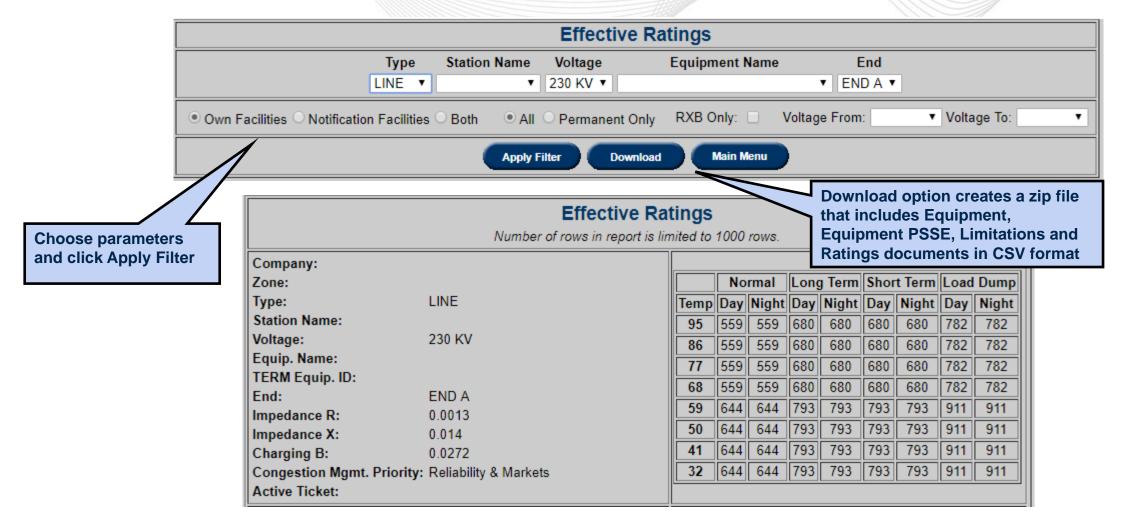
Effective Ratings



Click on Effective Ratings

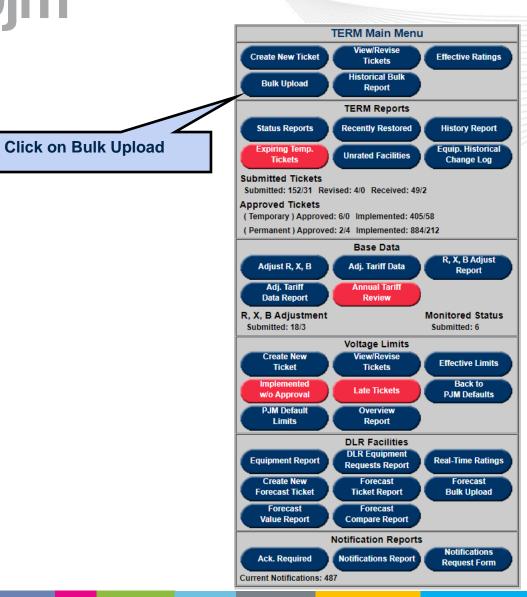


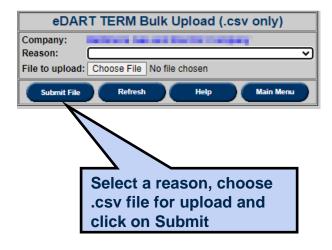
Effective Ratings



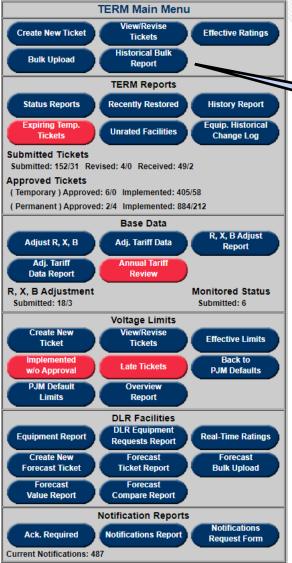


Bulk Upload





Bulk Upload



Click on Historical Bulk Upload

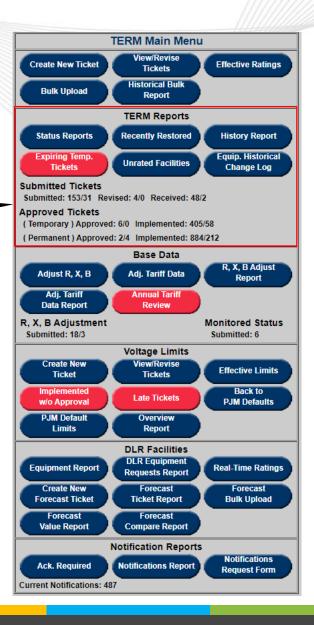


Click on Download hyperlink to download submitted data



TERM Reports

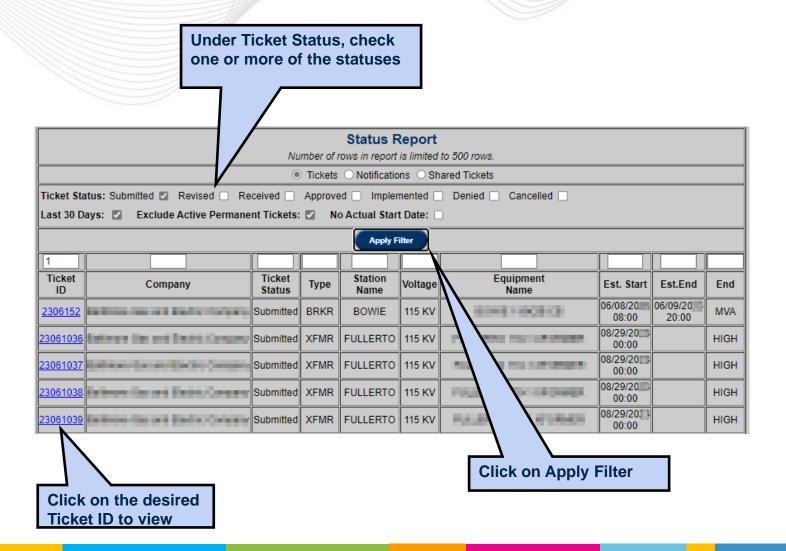
Owner (X) Ticket area summarizes number of tickets/number of notifications for tickets within the owner's zone





TERM Status Report







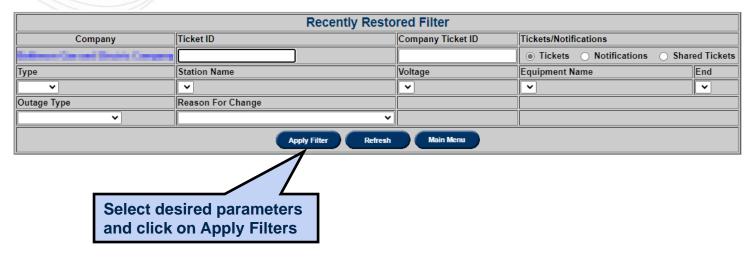
TERM Ticket Revision

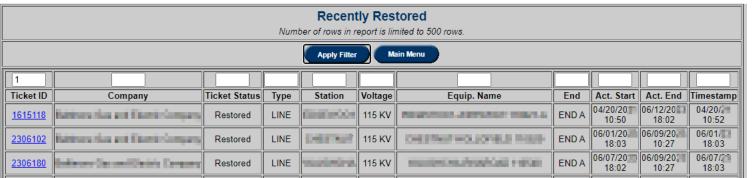
						TERM	Ticket F	Revision			
		cket ID:	×	User:	Cor	mpany:			eview the Ticket		
Reason for Changes: Configuration Change Ticket Status: Submitted Dynamic: No Planned Permanent Est. Start: Immediate Temporary Est. End: Actual Start: Actual End: Comments: PJM Comments:											
Comn	nents:				PJM C	omments:					
		Type: L	INE Statio	n Name:		Voltage:	Eq	uipment Na	me:	End: END A	
			rmal		g Term Short Term				Dump		
	Temp	Day	Night	Day	Night	Day	Night	Day	Night	Impedance/Charging: R = 0.0001 X = 0.00053 B = 0.0012	
	95	491	491	632	632	632	632	671	671	Congestion Mngt. Priority:	
	86	517	517	651	651	651	651	688	688	GSU	
	77	542	542	669	669	669	669	705	705	Adj. %:	
	68	566	566	687	687	687	687	721	721	Apply	
	59	588	588	704	704	704	704	737	737	Approx	
	50	610	610	720	720	720	720	753	753	Сору:	
	41	630	630	736	736	736	736	767	767	Cell Up Copy	
	32	649	649	752	752	752	752	782	782		
	-	omit Form story Log	Duplicate Notificati	ons	Equipment listory Log omment Log	Default Ra	atings %	of Change	Limita	ations Files Main Menu	



Recently Restored Tickets Report





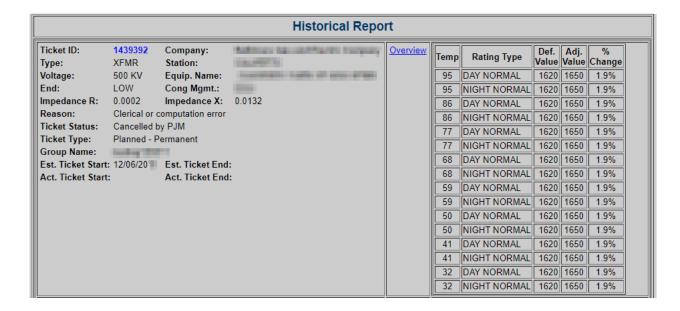




Historical Tickets Report



		Historical Report Filter		
Company	Ticket ID	Company Ticket ID	Tickets	Group Name
Bellinos des sel Brotis Company			Current OHistorical OBoth	
Туре	Station Name	Voltage	Equipment Name	End
~	~	~	~	~
Temporary	Permanent	Planned	Immediate	
Ticket Status	Tickets Occurring (mm/dd/yyyy)	Submittal Date (mm/dd/yyyy)	Implemented w/o Actual Start Date	
•	From: To:	From: To:		
		Apply Filter Refresh Main Menu		





Expiring Temporary Tickets Report



	Expiring Temporary Tickets Number of rows in report is limited to 500 rows. Implemented and Implemented w/o Approval tickets estimated to end before 07-07-2023 16:01:51													
Ticket ID	Company	Ticket Status	Туре	Station Name	Voltage	Equipment Name	Est. Start	Est.End	End					
2207417	Andrews has profession freeparty	Implemented w/o Approve	LINE	100000	115 KV	HORNOGENERAL HORO	07/14/20 <u></u> 14:54	07/07/20 00:00	END B					
22102344	CONTRACTOR STATE OF THE STATE O	Implemented w/o Approve	XFMR	HINDRED.	115 KV	NAMES OF BRIDE	10/20/20 18:02	07/07/20 00:00	HIGH					
2207968	Martin Company	Implemented w/o Approve	LINE	-	230 KV	BOOK TENNESSEE FOR	07/14/20 14:54	07/07/20 00:00	END B					
2207967	Bell State State of Barber Stryan,	Implemented w/o Approve	LINE	BANKS THE	230 KV	RUBUTE-INVOICE-CHART	07/14/2011R 14:54	07/07/20 00:00	END A					
2207846	BARTON SERVICE SAME	Implemented w/o Approve	LINE	-	230 KV	MANAGORITHANIA F	07/14/20 14:54	07/07/20 00:00	END A					



Unrated Facilities Report



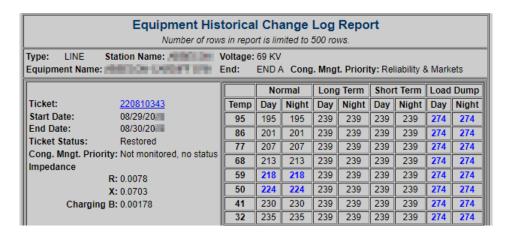
Unrated Facilities for Market and Market Campany											
0 - Not Monitored / No Status 🔲 1 - Reliability & Markets 🗹 2 - Reliability BES 🗹 3 - Status Only 🗌 4 - External Reliability 🗹											
5 - External Status Only 🗌 6 - Reliability Non-BES 🗹 7 - GSU 🗍 8 - Future 🗍											
Exclude Future Equipment 🗹 Include Exceptions 🗆											
Apply Filter Refresh											
Exception	Company	Туре	Station	Voltage	Equipment Name	End	TNA Monitored Priority	Last MP Update	Effective Date	Exception Timestamp	
	MERCHANIST SOCIETY OF	LINE	COLUMN TO	115 KV		END A	6	02/23/20	02/23/20		
Export to CSV Exceptions Log Main Menu											



Equipment Historical Change Log

TERM Reports						
Status Reports Recently Restored History R	eport					
Expiring Temp. Unrated Facilities Equip. His Change	1					
Submitted Tickets Submitted: 152/31 Revised: 4/0 Received: 49/2						
Approved Tickets (Temporary) Approved: 6/0 Implemented: 386/58						
(Permanent) Approved: 2/4 Implemented: 884/212						

Equipment Historical Change Log					
Type:	Station Name:	Voltage:			
~	~	~			
Equipment Name:	End:	Ticket Status:			
~	•	Approved Cancelled by Company Cancelled by PJM			
Tickets Occurring:					
From: (mm/dd/yyyy)	To: [
Apply Filter Main Menu					





Manual References for Ratings

PJM Manual 03: Transmission Operations

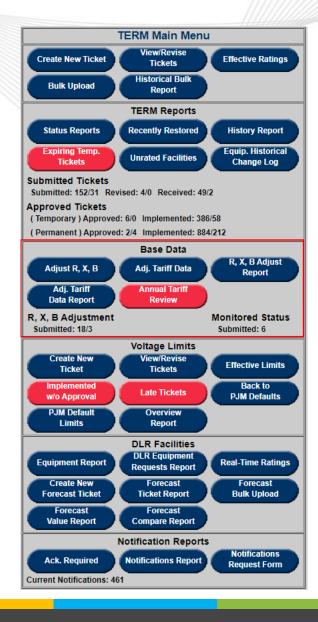
- Section 2: Thermal Operating Guidelines
- Section 3: Voltage & Stability Operating Guidelines

PJM Manual 03A: EMS Model Updates and QA

Appendix A: TERM Equipment Ratings Update Process

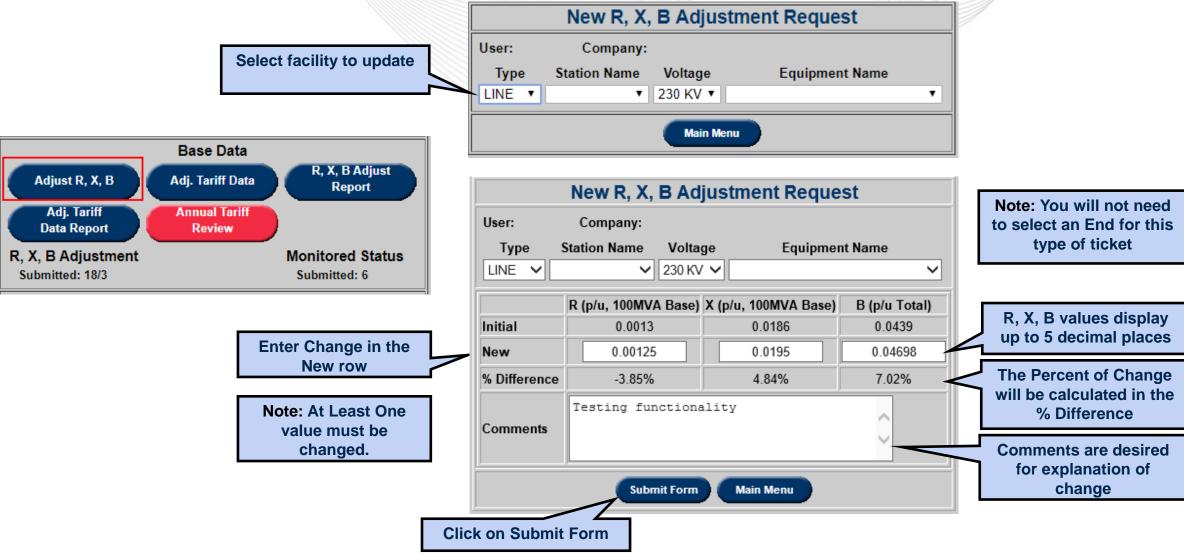


Base Data





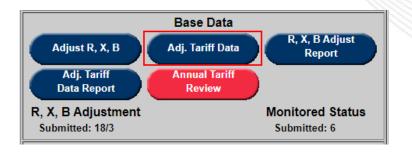
R, X & B Adjustment



www.pjm.com | Public PJM©2023



Adj. Tariff Data

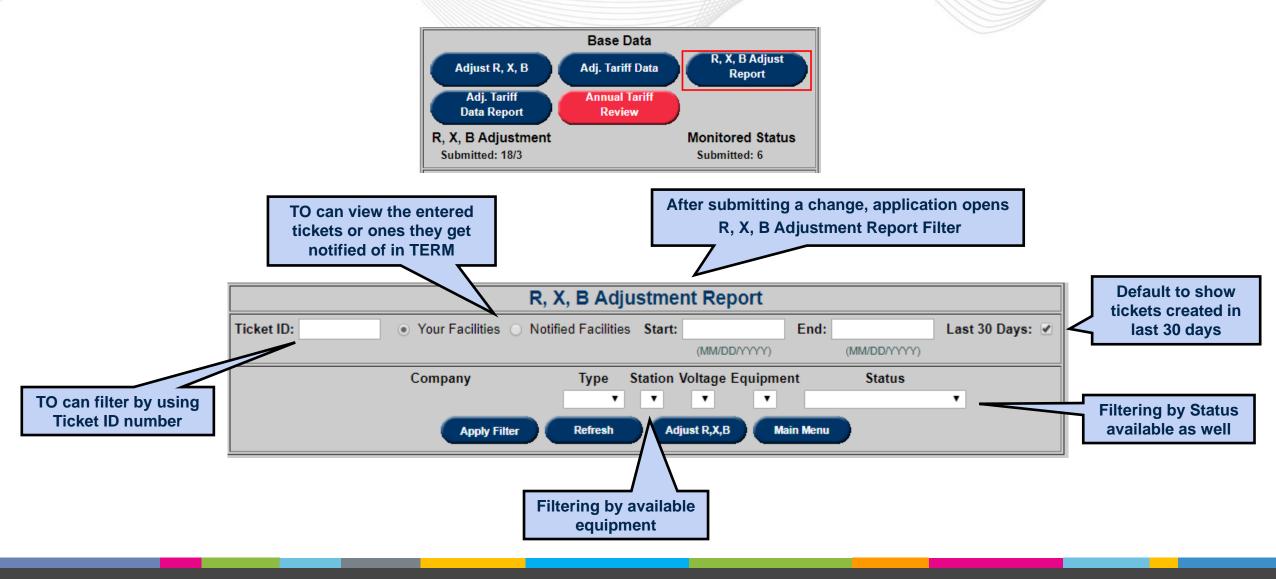








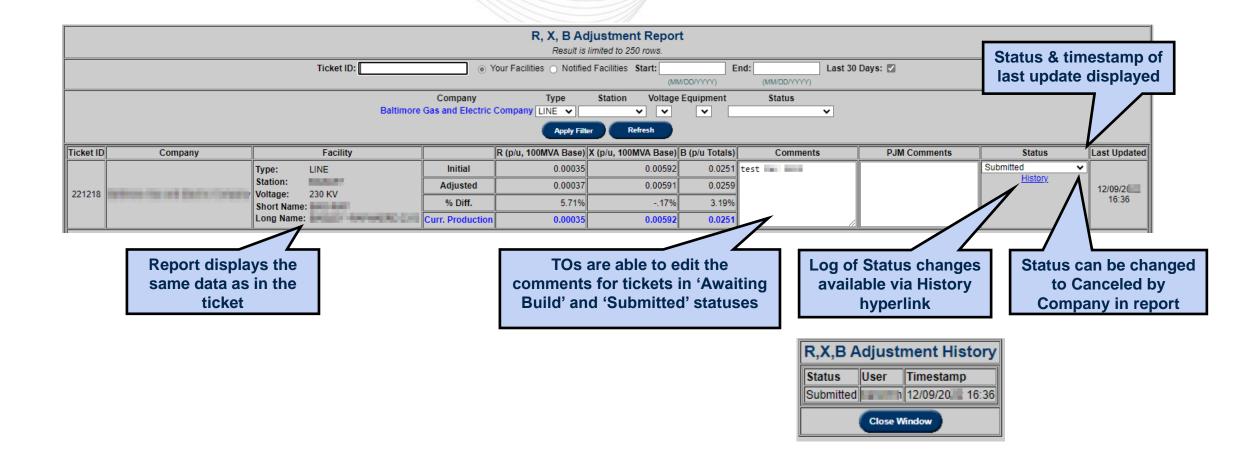
R, X & B Adjustment Report - Filtering



www.pjm.com | Public 43 PJM©2023



R, X & B Adjustment Report





R, X,B Adjustment Report Status

■ Submitted

Ticket has been submitted to PJM

☐ Awaiting Build

- Ticket submitted by TO with R, X, B values differences less than 10% as compared to current production values.

Implemented

- Data from ticket has been formatted for entry into the PJM EMS

□ Cancelled by PJM

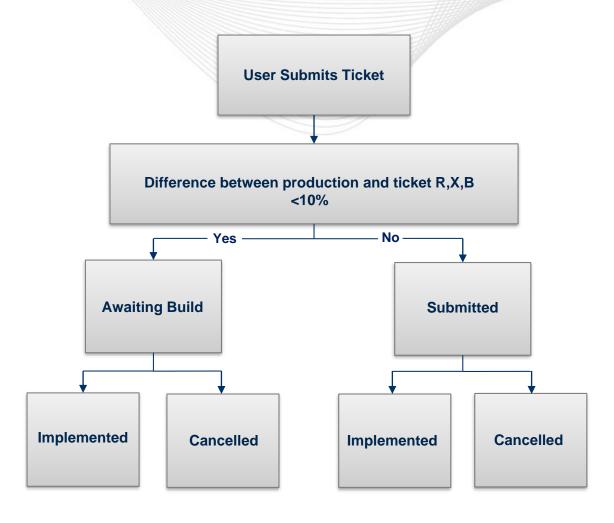
- Ticket can be cancelled by PJM for various reasons

□ Cancelled by Company

- Ticket can be cancelled by TO for various reasons

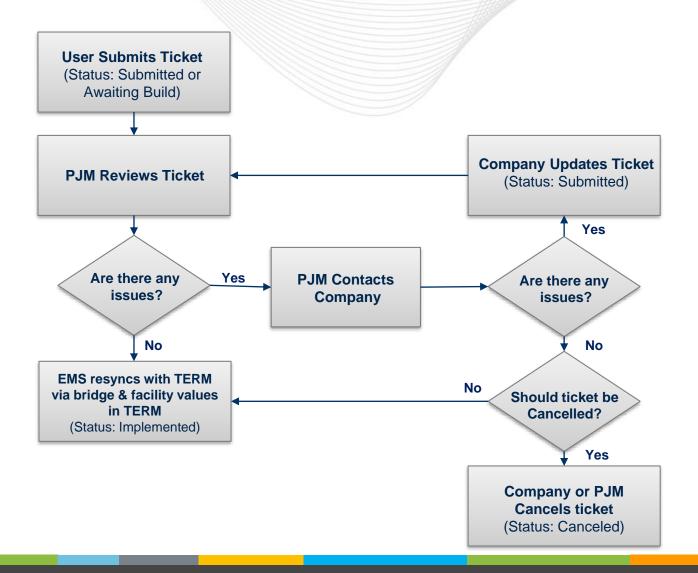


R, X, B Ticket Lifecycle Simplified





R, X, B Ticket Lifecycle Simplified

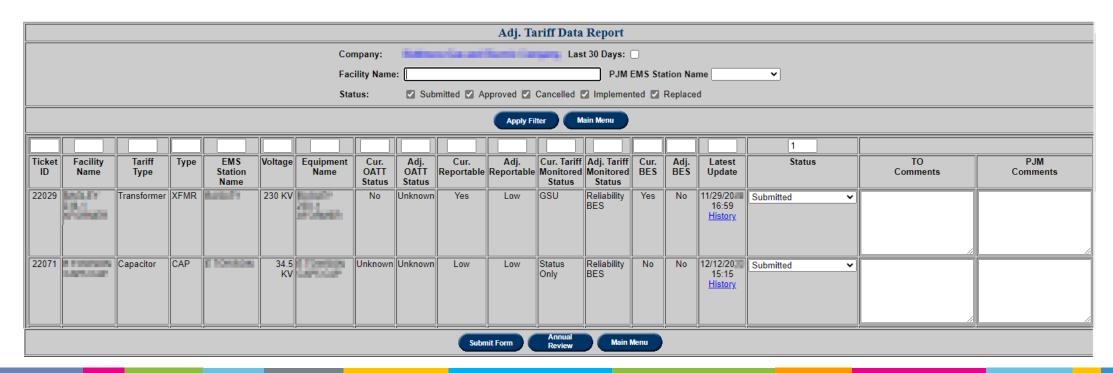




Adj. Tariff Data Report

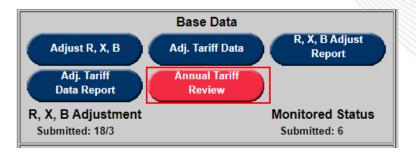
Base Data					
Adjust R, X, B	Adj. Tariff Data	R, X, B Adjust Report			
Adj. Tariff Data Report	Annual Tariff Review)			
R, X, B Adjustment Submitted: 18/3		Monitored Status Submitted: 6			

Adj. Tariff Data Report					
Company: Last 30 Days: ☑					
Facility Name:		PJM EMS Station Name			
Status: ✓ Submitted ✓ Approved □ Cancelled □ Implemented □ Replaced					
Apply Filter Main Menu					

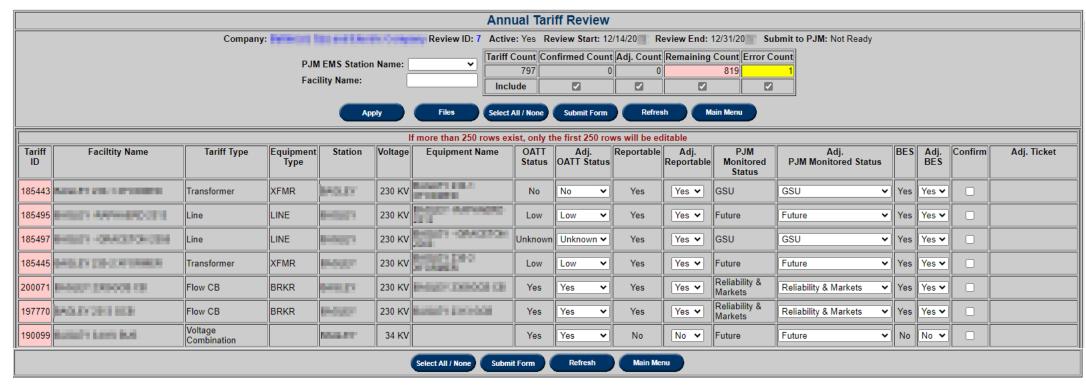




Annual Tariff Review

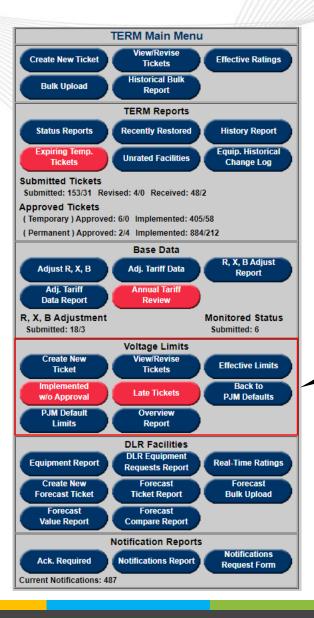








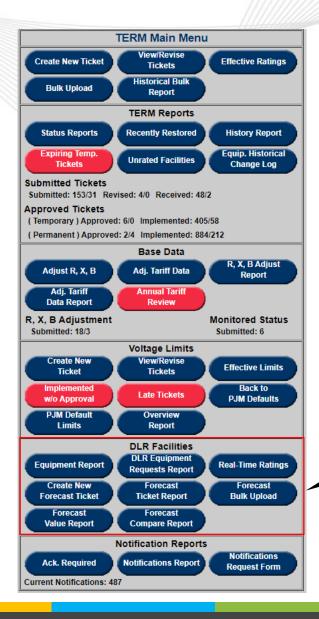
Voltage Limits



Voltage Limits section is covered in another presentation that can be found here: https://pjm.com/-/media/etools/edart/transmission-voltage-limits.ashx



DLR Facilities

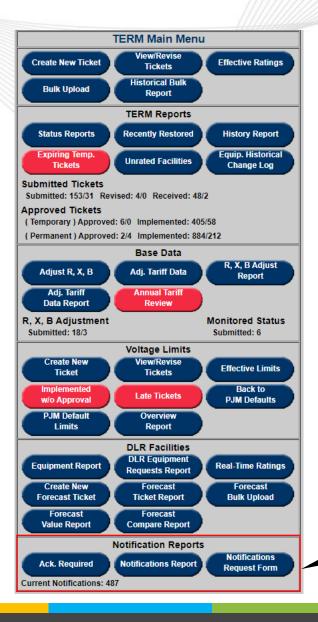


DLR Facilities section is covered in another presentation that can be found here:

https://www.pjm.com/-/media/etools/edart/dynamic-ratings.ashx



Notification Reports



Owner (X) Notification area where notifications can be Requested, Acknowledged or Removed from Notification List for other transmission zones



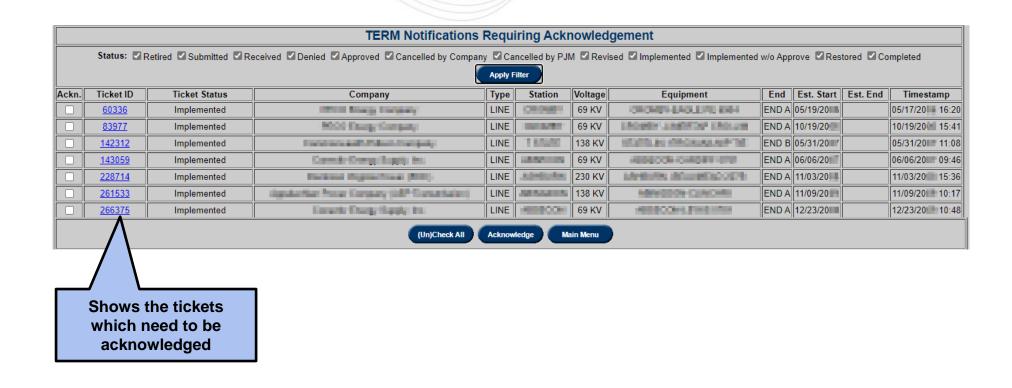
TERM Ticket Notifications

- TERM Tickets have two types of Notification
 - Owner (X)
 - Notification (Y)
- Status Reports inform TOs about their own TERM tickets
- Notifications Reports inform TOs about other TO tickets
- TOs (X) & other Transmission Companies (Y) can select and deselect the Zone and equipment for which they would like to receive notification
- TERM provides for the acknowledgement of notifications

www.pjm.com | Public 53

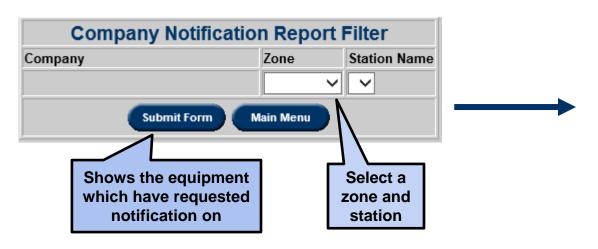


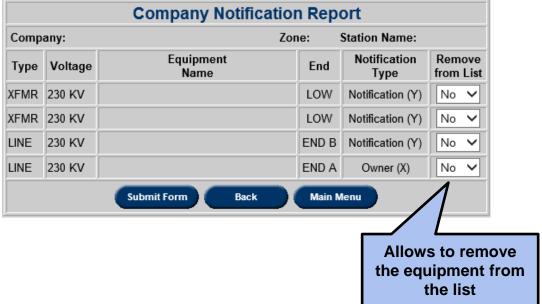
TERM Ticket Requiring Ack. Report





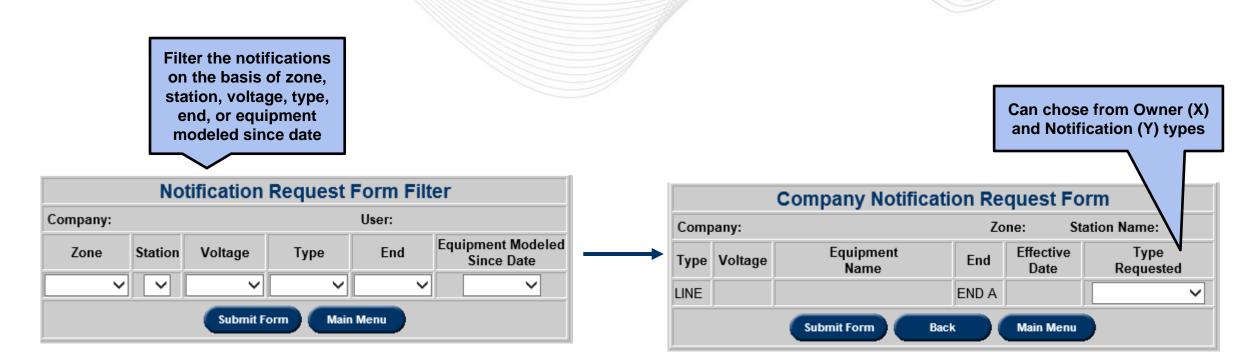
Company Notification Report







Company Notification Request Form



After Notification Request has been submitted, PJM will review and approve it



Contact Information

For more information or questions, please contact TERMTickets@pjm.com