

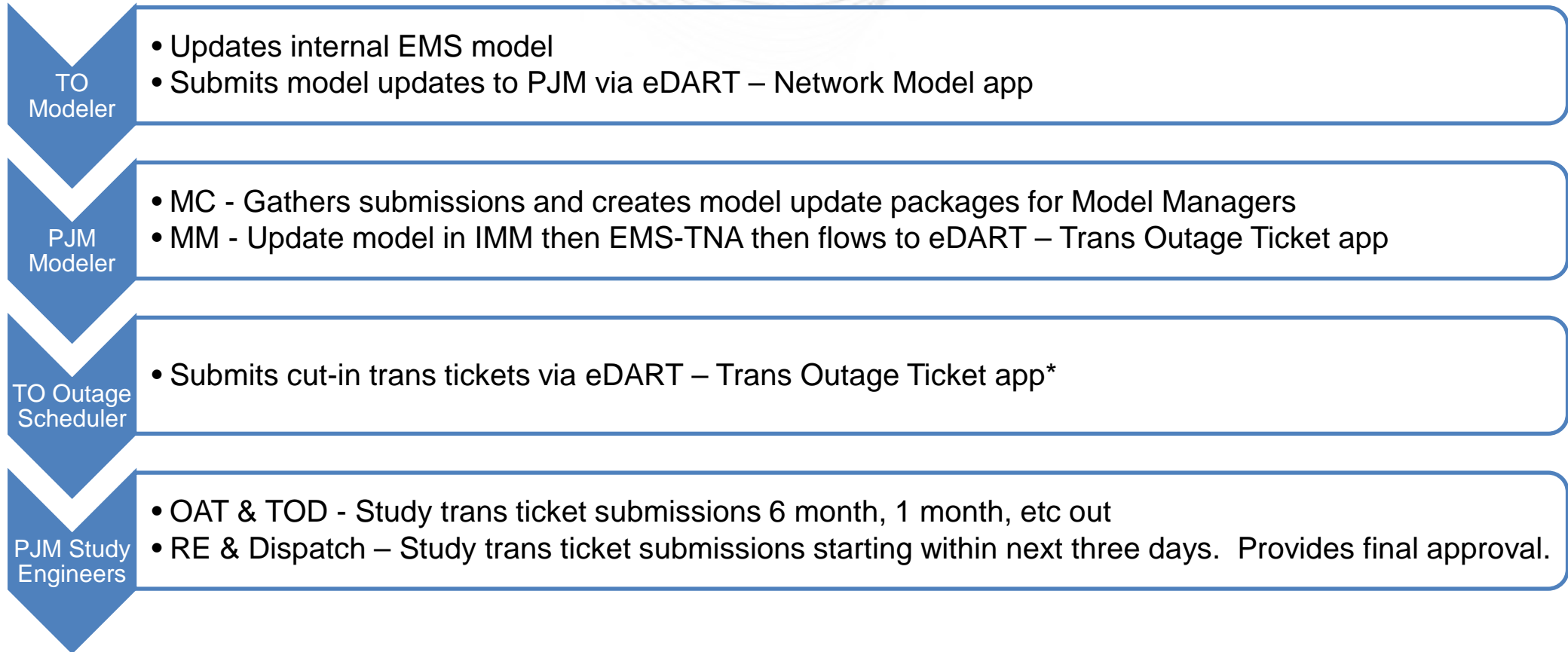


# Network Model to Transmission Outage Ticket Linkage Functionality

Ron DeLoach

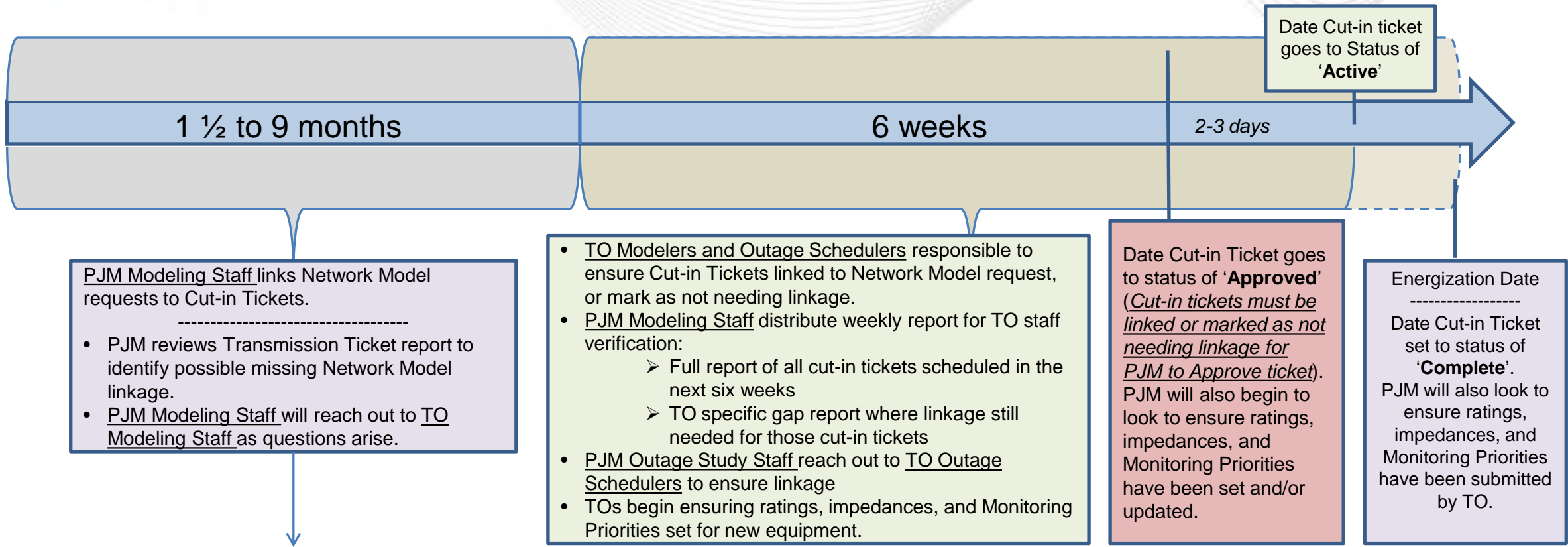
March 2016 DMS/eDUG Joint Meeting

- New functionality to link cut-in transmission tickets to Network Model updates ensuring model updates conducted in time for energization
  - Expected production date: 3/31/2016
- Presentation combination of business practice and technical application usage discussion



**\* Note: Equipment won't be available in Trans Outage Ticket app until modeled in Prod EMS-TNA**

eDART Application	Usage	Timing Requirements
<b>Network Model (NM)</b>	Transmission model updates	Manual 3A Section 3.2 - TOs are required to notify PJM from six (6) months to one (1) year in advance of system topology changes.
<b>TERM</b>	Ratings and impedance updates	Manual 3A Section 3.2 - TOs are required to update the project's initial parameter data using the eDART TERM tool for Line impedances and ratings updates. The data must be received by PJM no later than two (2) weeks prior to the scheduled cut-in.
<b>Transmission Outage Ticket (TOT)</b>	Transmission outage and cut-in tickets	Manual 3 Section 4.2.1 - The TO is required to submit all outage requests in excess of 5 calendar days in duration before the 1st of the month six months in advance of the start of the outage. Outages exceeding 30 calendar days in duration for the following planning cycle (June 1 – May 31) must be submitted before February 1. The TO is required to submit all other outage requests before the 1st of the month prior to the month of the requested start date of the outage.



PJM Modeling Staff links Network Model requests to Cut-in Tickets.

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- PJM reviews Transmission Ticket report to identify possible missing Network Model linkage.
- PJM Modeling Staff will reach out to TO Modeling Staff as questions arise.

- TO Modelers and Outage Schedulers responsible to ensure Cut-in Tickets linked to Network Model request, or mark as not needing linkage.
- PJM Modeling Staff distribute weekly report for TO staff verification:
  - Full report of all cut-in tickets scheduled in the next six weeks
  - TO specific gap report where linkage still needed for those cut-in tickets
- PJM Outage Study Staff reach out to TO Outage Schedulers to ensure linkage
- TOs begin ensuring ratings, impedances, and Monitoring Priorities set for new equipment.

PJM Focus	Model Build Focus	Report Range
JAN/FEB/MAR	Spring / Summer	Today + 6 weeks to Fall Model Build Date
APR/MAY/JUN/JUL	Summer / Fall	Today + 6 weeks to Winter Model Build Day
AUG/SEPT/OCT	Fall / Winter	Today + 6 weeks to Spring Model Build Day
NOV/DEC	Winter / Spring	Today + 6 weeks to Summer Model Build Day

- The functionality can be accessed either under the Trans. Tickets or Network Model menus

**Transmission Outage Main Menu**

Create New Outage Ticket | View/Revise Outage Ticket | EMS Trip Update | Gen Outage Lookup  
Future Facilities | Current One Line Diagrams | RTEP Queue # Update | **Network Model Link**

**Transmission Reports**

Status Report | Trans. Outage Tickets Report | Tickets Active Tomorrow  
Submitted: 14 / 1 Revised: 2 / 0 Received: 267 / 72  
Approved: 4 / 4 Active: 10 / 6 **Incomplete: 2** **At Risk: 2**

**Conflicts**

Conflicting Outages | Confl. Identifier Facility List | Confl. Identifier Group List | Gen Off Scenario List  
Submitted: 1 Revised: 0 Received: 1 Approved: 0 Active: 0

**NERC-TADS**

NERC-TADS Report | Ticket Update | Ticket Date Exception | Transformer Selection

**Generation Reports**

Generation Ack. Required | Owners Report | Tickets Active Tomorrow | D-Curve Report  
Notifications: 234

**Notification Reports**

Transmission Ack. Required | Notifications Report | Notifications Request Form  
Notifications: 119

**Facility Outages Reports**

Current & Future | Historical | EMS Outage List

**Network Model Main Menu**

Create New Change Request | View/Revise Change Request | Current One Line Diagrams  
Future Facilities | **Cut-In Ticket Link**

- This will enable conversations between modelers, outage scheduling & dispatch staff





# eDART Network Model to Cut-In Transmission Outage Ticket Linkage

- There will be two views of the reports for each direction of linkage.

**Network Model View**  
(Linking Trans. Tickets to Network Model Requests)

**Network Model Request/Cut-In Ticket Report**

Company: [Dropdown] Build Date Range: [From: / To: /] Station: [Dropdown]

Exclude Completed  
 Exclude Cancelled  
 Missing TOT Link

[Apply Filter](#)

Req. ID	Company	Title	Status	Stations	Target Build	Actual Build	Transmission Outage Ticket(s)
2000	PJM TEST	less than ecr_pt greater than alert(document.co	Approved	STATION 1	Fall 2006		Remove <a href="#">Ticket(s)</a> 508145 521459 472881 <a href="#">Add</a>
2005	PJM TEST	New Gen unit at STATION 1	Received	STATION 1, STATION 2	Fall 2006		Remove <a href="#">Ticket(s)</a> 512607 <a href="#">Add</a>
3206	PJM TEST	Retiring two units	Approved	STATION 4	Fall 2006		Remove <a href="#">Ticket(s)</a> 215263 525877 <a href="#">Add</a>

[Submit](#) [Refresh](#) [Export to CSV](#) [Main Menu](#)

**Transmission Ticket View**  
(Linking Network Model Requests to Trans. Tickets)

**Network Model Request/Cut-In Ticket Report**

Network Model View  Transmission Ticket View

Company: **Electric Company** Occuring During: From: 08/19/2015 To: 08/19/2016

Cut-In Tickets Only  
 Missing Network Model Request

Ticket Status: Submitted  Received  Denied  Approved  Cancelled by Company  Cancelled by PJM  Revised  Active  Completed

[Apply Filter](#) [Clear Filter](#) [Main Menu](#)

Ticket ID	Ticket Status	Company	RTEP#	Station	Voltage	Equipment	Start Date	End Date	Latest Update	Network Model Request(s)
<a href="#">66507</a>	Submitted	Electric Company	234B	APPLE	138 KV	APL-BNA	04/28/2016 00:00	05/13/2016 00:00	04/21/2015 12:11	Remove Request RTEP# <input type="checkbox"/> <a href="#">3925</a> <a href="#">Add</a>
<a href="#">66508</a>	Submitted	Electric Company		ORANGE	138 KV, 345 KV	DUMT1,T-1	04/28/2016 00:00	05/13/2016 00:00	04/21/2015 12:16	No Request Needed: <input type="checkbox"/> <a href="#">Add</a>

[Submit](#) [Export to CSV](#) [Main Menu](#)

## Transmission Ticket View (Linking Network Model Requests to Trans. Tickets)

- Will be replacement source for 6 week cut-in report
- Default filter next 6 weeks
- Important for outage schedulers to ensure linkages maintained
- Any cut-in tickets must have linkage to move forward w/ approvals unless marked as not needing such
  - *Only if cut-in doesn't include topology changes use no linkage needed checkbox*
- Use "Add" button to link NM request to outage ticket
- RTEP# and Network Model Status columns added

Network Model Request/Cut-In Ticket Report

Network Model View     Transmission Ticket View

Occurring During (mm/dd/yyyy)    Company     Cut-In Tickets Only  
 From:    To:     Missing NMR Link  
*\*default to +/- 6 Months from Today*

Ticket Status: Submitted  Received  Approved  Revised  Active

Apply Filter

Ticket ID	Ticket Status	Company	Station	Voltage	Equipment	Start Date	End Date	Time Stamp	Network Model Request(s)
521634	Submitted	PJM Test	HOLMESBU	138KV	67 DIS	10/05/2015 07:00	10/09/2015 16:00	05/23/2015 12:56	<input type="checkbox"/> No Network Model Request Needed Remove Requests <input type="checkbox"/> 2000 <input type="checkbox"/> 2356 <input type="checkbox"/> 6324 Add
526412	Approved	PECO Energy Company	MASTER	230KV	BUC...	04/05/2015 05:00	05/06/2015 15:30	03/08/2015 08:35	<input checked="" type="checkbox"/> No Network Model Request Needed Add
265826	Revised	PECO Energy Company	CALLOWHI					01/17/2015 9:16	<input type="checkbox"/> No Network Model Request Needed Remove Requests <input type="checkbox"/> 1255 <input type="checkbox"/> 8325 Add
326512	Approved	PECO Energy Company	GRAYSFER	230KV	275 CB	11/16/2015 9:00	12/30/2015 15:30	10/18/2015 13:00	<input type="checkbox"/> No Network Model Request Needed Remove Requests <input type="checkbox"/> 5214 <input type="checkbox"/> 7854 Add

Submit    Refresh    Export to CSV    Main Menu

In the case of multiple stations and/or voltages all will be displayed, comma delimited



## Add Network Model Request

Include	RTEP#	Request #	Build	Title	Company
<input type="checkbox"/>		<a href="#">4225</a>	Winter 2015/16	Vy s Test 1/11/16	Electric Company
<input type="checkbox"/>		<a href="#">4286</a>	Fall 2006	Westport 115kV test	Electric Company
<input type="checkbox"/>		<a href="#">4248</a>	M	title	Electric Company

Request #:

- Clicking “Add” will open form to do linkage
- NM Requests for builds within one year before outage ticket start date and one year post end date including any of the stations in the outage tickets will be displayed for potential linkage selection
- User can also manually enter NM request numbers, separated by commas if adding multiple
- Click “Add” to submit selections

- A “Modeling Requests” button will be added to all Trans. Tickets with linked Network Model Requests.
- Clicking on the button will pull up a report of all linked requests w/ hyperlinks to view print versions of the requests.
- Any files attached to the NM requests will be available for download.

**Review/Revise Transmission Ticket**

User: Company: Status: **Cancelled by PJM** Ticket ID:

Company Ticket ID: fe RTEP Queue #: erert

Ticket Start		Ticket End		Switch Date	
02/01/2001	22:00	02/28/2001	22:00	02/01/2001	22:00
Date (mm/dd/yy)	Hour (hh24:mi)	Date (mm/dd/yy)	Hour (hh24:mi)	Date (mm/dd/yy)	Hour (hh24:mi)

**Location/Description of Work (4000 char. max)**

Yearly maintenance work

**PJM Comments**

Ticket Canceled by PJM.

**Mitigated Comments**

**Information/Hotline Work**

Emergency

Vegetation Trip

Cut In

Direct Billing

Direct Billing Decline

Potentially Incomplete: No

At Risk: No

Congestion Expected: No

Submitted On-Time: No

Market Sensitive: No

Automatic Re-Close: No

Mitigated: N/A

**Cause**

- Add SF-6 Gas
- C.B. Replacement
- CB Maintenance
- Cable Repair
- Contingency Planning
- Cut-in
- Disconnect/Ground Sw. Maintenance
- Doble Test
- Emergency
- Excludable Outage
- External
- Fire on Equipment/in Vicinity
- Gas/Oil Testing/Replacement
- High System Voltage
- Hot Spot Repair

**Ticket History**

	Time Stamp	Usr. Name
Submitted		
Received		
Approval		
Latest Revision		

Outage Type: Daily - No Weekends Availability: Immediate

Planned: N/A Operational: N/A

Buttons: Print Version, Date Time Log, History Log, Notifications Log, Duplicate Ticket, View Conflicts, Gen Off Conflicts, Gen. Outage Lookup, Comments Log, NERC-TADS Reports, **Uncancel Ticket**, Projects, Main Menu, **Modeling Requests**

- XML functionality also updated to include linked information on NM requests on transmission ticket download for TO in-house applications.

eDART Network Model Requests - Windows Internet Explorer

Network Modeling Requests for Ticket ID 569868

Request #	Title	Description	Status	Build	Attachments
<a href="#">12832</a>	New breakers at STATION1	Add three new 138KV breakers	Implemented	Fall 2009	
<a href="#">25963</a>	STATION10 - Retire breaker	Retire breaker. See attachment.	Implemented	Fall 2009	<input type="checkbox"/> Project 1234.pdf

Buttons: Download, Close Window

- Information from Network Model Requests viewable from Transmission Outage Ticket
- Cut-In outage tickets can't be changed to status of Approved or Active if no NM request linked or ticket not identified as not needing one

Network Modeling Requests for Ticket ID 564072

Request #	Title	Description	Status	Build	Attachments
12832	Add new line to STATION1.		Implemented	Summer 2015	Project11032017.pdf
12650	Update STATION4	Add three new 138kV breakers to convert to a 4-breaker ring bus.	Implemented	Summer 2015	

Refresh Download Exit

Attachments Cause Types

Modeling Tickets

Add Start Date

Add End Date

Reason for Change Log

Add Study

TARA Study Log

Congestion Log

Other Congestion Expected Tickets

Restoration Plan Review Needed

Submit Overtime Log

History Log

Market Operations Comments

Add SF-6 Gas

B. Overhaul

B. Replacement

Cable Repair

CB Maintenance

Contingency Planning

Cut-in

Disconnect/Ground Sw. Maintenance

Doble Test

Emergency

Excludable Outage

External

Fire on Equipment/in Vicinity

Gas/Oil Testing/Replacement

High System Voltage

Hot Spot Repair

Inspection/Maintenance

Install Antenna

LA Replace/Repair

NERC Alert

NERC Alert - Emergency

NERC Alert - Near Term

New Construction

Normally Open

Other

Overhaul Tap Changer

Relay Maintenance (Impact to primary clearing)

Relay Maintenance (No impact to primary clearing)

Relay Replacement (Impact to primary clearing)

Relay Replacement (No impact to primary clearing)

Modeling Tickets

**Gray Text (Disabled)**  
not a cut-in or verified that no NMR(s) are needed

Modeling Tickets

**Red Background (Disabled)**  
cut-in ticket that needs NMR linked or verification that no NMR is needed

Modeling Tickets

**Gray Background (Enabled)**  
NMR(s) is linked

- Similar functionality works in reverse where cut-in tickets can be linked to Network Model requests
- Linked cut-in tickets can be viewed from Network Model requests
- Linkages made on either end will show up on both sides
- See Appendix for step-by-step functionality walkthrough

- Expected Production Date: 3/31/2016
- Initial Data Linkage:
  - PJM MMD staff performed first round of links
  - Where gaps identified TO reach out starting soon
  - First couple days after release additional MC coverage to help address gaps



# Appendix:

# Linking Cut-in Tickets to Network Model Requests

Ron DeLoach

March 2016 DMS/eDUG Joint Meeting

## Network Model View (Linking Trans. Tickets to Network Model Requests)

- Used more by modeling staff usually w/ greater distance in time
- Updated initially w/ advanced outage ticket check timed around DMS meetings
- TO should use w/ outage scheduling staff to ensure they can check off on future modeling updates even prior to outage submission
- Use “Add” button to link outage ticket to NM request
- RTEP# and Trans Ticket Status columns added

**Network Model Request/Cut-In Ticket Report**

Network Model View     Transmission Ticket View

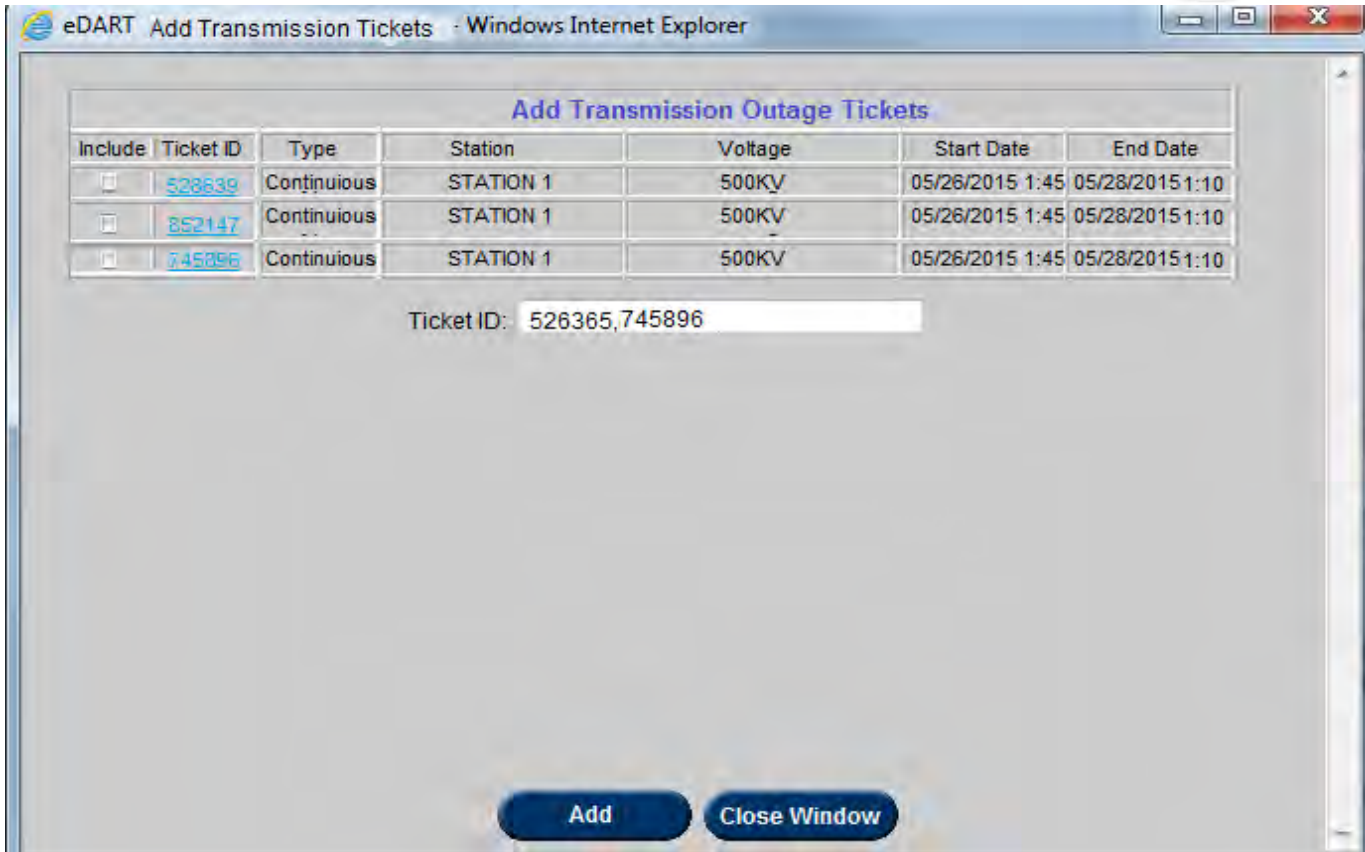
Company:     Build Date Range (mm/dd/yyyy): From:  To:     Station:

Exclude Completed     Exclude Cancelled     Missing TOT Link

Req. ID	Company	Title	Status	Stations	Target Build	Actual Build	Transmission Outage Ticket(s)
<a href="#">2000</a>	PJM TEST	less than scri_pt greater than alert(document.co	Approved	STATION 1	Fall 2006		<input type="checkbox"/> <a href="#">Remove</a> <a href="#">Ticket(s)</a> <input type="checkbox"/> <a href="#">588146</a> <input type="checkbox"/> <a href="#">563499</a> <input type="checkbox"/> <a href="#">426853</a> <input type="button" value="Add"/>
<a href="#">2005</a>	PJM TEST	New Gen unit at STATION 1	Recieved	STATION 1; STATION 2	Fall 2006		<input type="checkbox"/> <a href="#">Remove</a> <a href="#">Ticket(s)</a> <input type="checkbox"/> <a href="#">532687</a> <input type="button" value="Add"/>
<a href="#">3256</a>	PJM TEST	Retiring two units		STATION 4	Fall 2006		<input type="checkbox"/> <a href="#">Remove</a> <a href="#">Ticket(s)</a> <input type="checkbox"/> <a href="#">245963</a> <input type="checkbox"/> <a href="#">525877</a> <input type="button" value="Add"/>

In the case of multiple stations all will be displayed, comma delimited



- Clicking “Add” will open form to do linkage
- Outage Tickets flagged as Cut-In, including any of the stations in the NM request, w/ status of approved, active, received or completed will be displayed for potential linkage selection scheduled up to a year before & after the build date
- User can also manually enter ticket numbers, separated by commas if adding multiple
- Click “Add” to submit selections

- A “Trans. Tickets” button will be added to all Network Model Requests with linked Transmission Tickets.
- Clicking on the button will pull up a report of all linked tickets with hyperlinks to view print versions of the tickets.

Earliest Equip. In Service Date: 08/15/2007 Target Model Build: Fall 2006 Actual Model Build: No  
 In Progress: No Entry Date: 08/09/2006 23:38  
 Submit On-Time: Late Submit Evaluation Date: 04/28/2015 [On-Time Log](#)

Change Request was Submitted or Revised on 04/28/2015.  
 For the Fall 2006 Build, the request needs to be submitted by 04/07/2015.  
 Please contact your PJM Model Coordinator.

[Breakers/Disconnects](#)

Station	Voltage	B3 Name	Status
	115 KV		Original
	115 KV		Original
	115 KV		Original
	115 KV		Original

[Busbar](#)

Station	Voltage	B3 Name	Status

[Shunts](#)

Station	Voltage	B3 Name	Status

[Generators/SVCs](#)

Station	Voltage	B3 Name	Status
	34 KV		Original

[Loads](#)

Station	Voltage	B3 Name	Status

[Lines](#) Telemetry Review Needed

Station	Voltage	B3 Name	Status
	115 KV		New
	115 KV		Original
	115 KV		Original

[Phase Shifters](#)

Station	Voltage	B3 Name	Status

[Series Devices](#)

Station	Voltage	B3 Name	Status

[Transformers \(Single Winding\)](#)

Station	Voltage	B3 Name	Status
	115 KV		Original
	115 KV		Original

[Transformers \(Three Winding\)](#)

Station	Voltage	B3 Name	Status

[Status History](#) [Files](#) [Trans. Tickets](#) [Email](#) [Refresh](#) [Main Menu](#)

eDART Add Transmission Tickets - Windows Internet Explorer

Transmission Tickets for Request # 12345

Ticket ID	Type	Station	Voltage	Company	Start Date	End Date
<a href="#">528639</a>	Continuous	STATION1, STATION2	500KV, 345KV, 230KV	Company ABC	05/26/2015 1:45	05/28/2015 1:10
<a href="#">857147</a>	Continuous	STATION10	345KV, 230KV	Company 1234	05/26/2015 1:45	05/28/2015 1:10
<a href="#">745886</a>	Continuous	STATION1, STATION 10	500KV, 230KV	Company ABC	05/26/2015 1:45	05/28/2015 1:10

In the case of multiple stations and/or voltages all will be displayed, comma delimited

[Close Window](#)