

# Fundamentals of Transmission Operations

## *Equipment Outages*



**PJM State & Member Training Dept.**

At the end of this presentation the Learner will be able to:

- Identify how weather may influence outage planning
- Explain how to communicate a transmission equipment outage request to PJM
- Explain how to modify outage requests with PJM
- Coordinate operations with neighboring systems and PJM
- Explain the notification and coordination requirements, given a real-time outage

- Outage planning and Weather
- **Outage Reporting Guidelines**
- eDART
- Communications and Notifications

- Peak Period Outage Scheduling Guidelines
  - Transmission owners should avoid scheduling any outage in excess of 5 days in duration with no restoration time or a restoration time greater than 5 days that may result in increased risk to system reliability during peak summer and winter periods
  - These periods are defined as June 15 – August 31 and January 1 – February 28, respectively
  - These outages include those that may result in:
    - Actual or post-contingency thermal or voltage issues with insufficient generation for control
    - Constraints that are load sensitive with limited controlling actions
    - Stability issues or bottled generation

- Peak Period Outage Scheduling Guidelines (cont.)
  - Transmission owners shall screen for peak period outages prior to submittal in eDART and look to reschedule during shoulder months
    - The transmission owners are encouraged to schedule non-impactful outages during peak seasons
  - PJM shall screen for peak period outages when performing outage analysis
  - PJM may grant exception to ensure RTEP upgrades are installed within specified timeframes or as special circumstances warrant

- Coordinating Outage Requests with Planned Nuclear Generation Outages
  - When a Transmission Owner submits an Outage Request that will open a Nuclear Generating Station's Unit Breaker the following guidelines shall be observed:
    - All Nuclear Unit breaker Outage Requests shall be coordinated closely with the Nuclear Station to coincide with a Unit outage
    - In the case that the Outage Request cannot be delayed until the next Unit Outage, the Nuclear station should be given at least six weeks notice. The schedule for opening the Unit Breaker must be closely coordinated with the station. The length of time that the breaker remains open should be minimized
    - PJM will work with the Nuclear Station's and the Transmission Owner's outage needs

- **Coordinating Outage Requests with Planned Nuclear Generation Outages**
  - The Nuclear Generating Stations coordinate the scheduling of a Unit Breaker outage and internal plant equipment outages and testing to minimize station risk
  - Adherence to outage schedule and duration is critical to the plant during these evolutions
  - Any emergent plant or transmission system conditions may require schedule adjustments, which should be minimized
  - Any change to the outage schedule that impacts the Unit Breakers shall be communicated to the nuclear generator operator

- Transmission Owners:
  - Shall submit tentative dates of all planned transmission outages of reportable transmission facilities as far as in advance as possible
  - Reasonable effort to submit one year in advance
- Transmission Owners are required to provide notice of all transmission outages prior to the first day of the month preceding the month of the outage
- Transmission Owners are also required to report “Hot Line Work” performed on facilities 345 kV and above

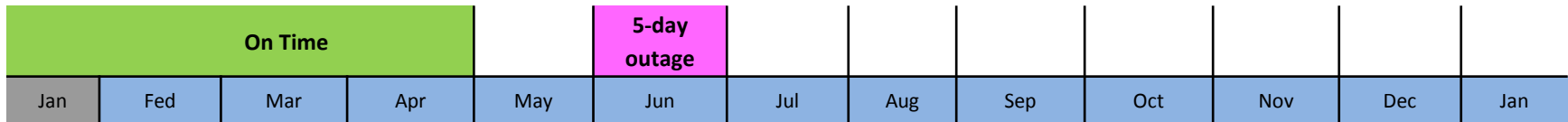


- Why do In-service Work?
  - Reliability
  - Economics
- Type of In-service Work
  - Relay calibrations
  - Relay carrier/transfer trip test
  - Hot line work
  - Restrictions preventing auto-reclosure
- Operator Concerns
  - Increased probability of tripping
  - Awareness of work in area

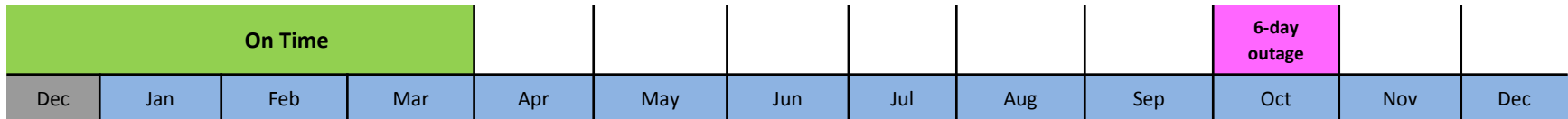
- Hotline Ticket Rule (Bucket 1): Transmission Owners are required to provide notice of all hotline transmission work five days or less by 0800 three days **prior to** the start of the outage (345kV and above)
  - Hotline work starting on March 16, 2017 must be submitted by 07:59 on March 13, 2017 to be on time

On Time			5 day or less hotline transmission work						
Sat March 11th	Sun March 12th	Mon March 13th	Tue March 14th	Wed March 15th	Thurs March 16th	Fri March 17th	Sat March 18th	Sun March 19th	

- 1-Month Rule (Bucket 2): Transmission Owners are required to provide notice of all transmission outages five days or less **prior to** the first day of the month preceding the month of the outage
  - A 5-day outage starting in June, 2017 must be submitted by 23:59 on April 30, 2017 to be on time



- 6-Month Rule (Bucket 3): The TO is required to submit all outage requests in excess of 5 days in duration **prior to** the 1st of the month six months in advance of the start of the outage
  - If a 6-day outage begins in October, the outage must be submitted by 23:59 on March 31 to be on time



- 30-Day Rule (Bucket 4): Outages scheduled for the following Planning year (i.e. June 1 – May 31) exceeding 30 days in duration are to be submitted via eDART **prior to** February 1 for use in the annual FTR auction unless the 6-month rule is more restrictive

## Example 1:

- An outage greater than 30 days starts in September 2017. It must be submitted by:
  - 6-month rule: Must be submitted by February 29, 2017 @ 23:59

on time		1	2	3	4	5	6	30+ day outage				
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan

- 30-day rule: Must be submitted by January 31, 2017 @ 23:59

on time								30+ day outage				
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan

- Since the 30-day rule is more conservative, it applies

## Example 2:

- An outage greater than 30 days starts in July 2017. It must be submitted by:
  - 6 month rule: December 31, 2016 @ 2359

on time	1	2	3	4	5	6	30+ day outage					
Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

- 30 day rule: January 31, 2017 @ 2359

	on time						30+ day outage					
Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

- Since the 6 month rule is more conservative, it applies

- If a ticket was submitted “late”, reviewing the ticket will show that a comment is now displayed with the date/time the ticket should have been submitted to have been considered on time

**Review/Revise Transmission Ticket**

User: **studenttrans90** Company: **SBT Trans Comp 0** Status: **Submitted** Ticket ID: **69176**

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Company Ticket ID:  RTEP Queue #:

**Ticket Start**      **Ticket End**      **Switch Date**  
 05/18/2015 13:00    05/22/2015 23:59    05/18/2015 13:00    Change Dates

Date (mm/dd/yy)    Hour (hh24:mi)    Date (mm/dd/yy)    Hour (hh24:mi)    Date (mm/dd/yy)    Hour (hh24:mi)

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<p style="font-size: small; margin: 0;"><b>Location/Description of Work (4000 char. max)</b></p> <p style="margin: 0;">Replacing the conductor of the AMUS-ASH1 230 kVLine</p> <p style="font-size: small; margin: 0;"><b>PJM Comments</b></p> <div style="border: 1px solid gray; height: 20px; width: 100%;"></div> <p style="font-size: small; margin: 0;"><b>Mitigated Comments</b></p> <div style="border: 1px solid gray; height: 20px; width: 100%;"></div>	<p style="font-size: small; margin: 0;"><b>Information/Hotline Work</b></p> <p style="margin: 0;">Emergency <input type="checkbox"/></p> <p style="margin: 0;">Vegetation Trip <input type="checkbox"/></p> <p style="margin: 0;">Cut In <input type="checkbox"/></p> <p style="margin: 0;">Direct Billing <input type="checkbox"/></p> <p style="margin: 0;">Direct Billing Decline <input type="checkbox"/></p> <p style="margin: 0;">Potentially Incomplete: No</p> <p style="margin: 0;">At Risk: No</p> <p style="margin: 0;">Congestion Expected: No</p> <p style="margin: 0;">Submitted On-Time: No</p> <p style="margin: 0;">Market Sensitive: No</p> <p style="margin: 0;">Automatic Re-Close: No</p> <p style="margin: 0;">Mitigated: N/A</p>	<p style="font-size: small; margin: 0;"><b>Cause</b></p> <div style="border: 1px solid gray; padding: 2px;"> <p style="margin: 0;">Inspection/Maintenance</p> <p style="margin: 0;">Install Antenna</p> <p style="margin: 0;">LA Replace/Repair</p> <p style="margin: 0;">NERC Alert</p> <p style="margin: 0;">NERC Alert - Emergency</p> <p style="margin: 0;">NERC Alert - Near Term</p> <p style="margin: 0;">New Construction</p> <p style="margin: 0;">Normally Open</p> <p style="margin: 0;">Other</p> <p style="margin: 0;">Overhaul Tap Changer</p> <p style="margin: 0;">Relay Maintenance (Impact to primary clearing)</p> <p style="margin: 0;">Relay Maintenance (No impact to primary clearing)</p> <p style="margin: 0;">Relay Replacement (Impact to primary clearing)</p> <p style="margin: 0;">Relay Replacement (No impact to primary clearing)</p> <p style="margin: 0;">Repair/Replace Conductor</p> </div>	<p style="font-size: small; margin: 0;"><b>Ticket History</b></p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th></th> <th>Time Stamp</th> <th>Usr. Name</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><b>Submitted</b></td> <td>05/18/2015 10:12</td> <td>studenttrans90</td> </tr> <tr> <td style="text-align: center;"><b>Received</b></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><b>Approval</b></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><b>Latest Revision</b></td> <td></td> <td></td> </tr> </tbody> </table>		Time Stamp	Usr. Name	<b>Submitted</b>	05/18/2015 10:12	studenttrans90	<b>Received</b>			<b>Approval</b>			<b>Latest Revision</b>		
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<b>Latest Revision</b>																		

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Ticket was Submitted at 05/18/2015 10:12. For outages starting at 05/18/2015 13:00, the ticket needs to be submitted by 04/01/2015 00:00.

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**Outage Type**      **Availability**      **Restoration Plan Review Needed**  
 Continuous      Duration      N/A



- Outage planning and Weather
- Outage Reporting Guidelines
- **eDART**
- Communications and Notifications

- eDART stands for Dispatcher Applications and Reporting Tool
  - eDART is an internet tool for submitting Generation and Transmission operations and planning data to PJM and retrieving operations data from PJM

- Creating a New Transmission Outage Ticket - Business Rules
  - Ticket Start Date/Time must be prior to Ticket End Date/Time
  - Ticket must be submitted a minimum of 3 business days in advance of Ticket Start Date
    - Unless Emergency
  - Equipment Start and End Date/Time must be within Ticket Start and End Date/Time

A dark blue, rounded rectangular button with a subtle gradient and a slight shadow. The text 'Create New Outage Ticket' is centered on the button in a white, sans-serif font.

Create New  
Outage Ticket

### New Transmission Ticket

User: **okusaa** Company: **PJM Interconnection**

Company Ticket ID:  RTEP Queue #:

**Ticket Start**      **Ticket End**      **Switch Date**  
             
Date (mm/dd/yyyy)    Hour (hh24.mi)      Date (mm/dd/yyyy)    Hour (hh24.mi)      Date (mm/dd/yyyy)    Hour (hh24.mi)

**Location/Description of Work(4000 char. max)**    Information/Hotline Work     **Cause (Lookup)**  
      Emergency       Construction: Antenna  
    Vegetation Trip       Construction: New Equipment  
    Cut In       Cut-In  
    Direct Billing       Excludable Outage  
    Direct Billing Decline       External  
        Maintenance: CB  
        Maintenance: CCVT / Wave Trap

**Outage Type**      **Availability**      **Restoration Plan Review Needed**      **Add to Project**  
 Continuous       Immediate       N/A      

**Type**      **Station Name**      **Voltage**      **Equipment Name**  
 LINE       ABSECON       69 KV       ABSECON-CARDIFF 0781

Tier 1     Tier 2     Tier 3   
    
    
    
    
    
    

Default Status Change Only	Primary	Status	Include	Type	Station Name	Voltage	Equipment Name	Start Date	Start Hour	End Date	End Hour	Resulting Default Status
No <input type="text"/>	<input type="radio"/>	O <input type="text"/>	Yes <input type="text"/>	LINE	<a href="#">ABSECON</a>	69 KV	ABSECON-CARDIFF 0781	07/10/2017	10:00	07/14/2017	10:00	No Change <input type="text"/>
No <input type="text"/>	<input type="radio"/>	O <input type="text"/>	Yes <input type="text"/>	BRKR	<a href="#">ABSECON</a>	69 KV	ABSECON CARDIFDUM DIS	07/10/2017	10:00	07/14/2017	10:00	No Change <input type="text"/>
No <input type="text"/>	<input type="radio"/>	O <input type="text"/>	Yes <input type="text"/>	BRKR	<a href="#">CARDIFF</a>	69 KV	CARDIFF OCB G	07/10/2017	10:00	07/14/2017	10:00	No Change <input type="text"/>

- Location/Description of Work
  - Location of main work
    - i.e. KEENEY 51 TR or TMI-HOSENSACK 5026 line
  - Brief description of work
    - i.e. Overhaul, Relay Work, Repair, Line Work
  - Switching
    - Identify the word “SWITCHING”
    - List CBs or equipment that will be off for switching and approximate duration
      - i.e. Keeney ring CBS 240, 241 open 30 min for switching
    - If switching will last more than 1 hour, it is required to detail the switching instructions in the equipment list

- Informational/Hotline Work - Work is being performed on selected equipment, however that equipment remains energized
  - Breaker clearances not required
- Emergency - Outage due to equipment problem or tripping and must be taken immediately
  - 3 day notice NOT required for emergency job
- Vegetation Trip – If outage was a tripping caused by tree contact, this checkbox must be checked
  - These are reported to NERC

- Cut In - Energization of a new facility
- Direct Billing
  - TO will pay for the localized generator controlling actions
- Direct Billing Decline
  - TO will not pay for the localized generator controlling actions, but the late RTEP outage cannot be rescheduled

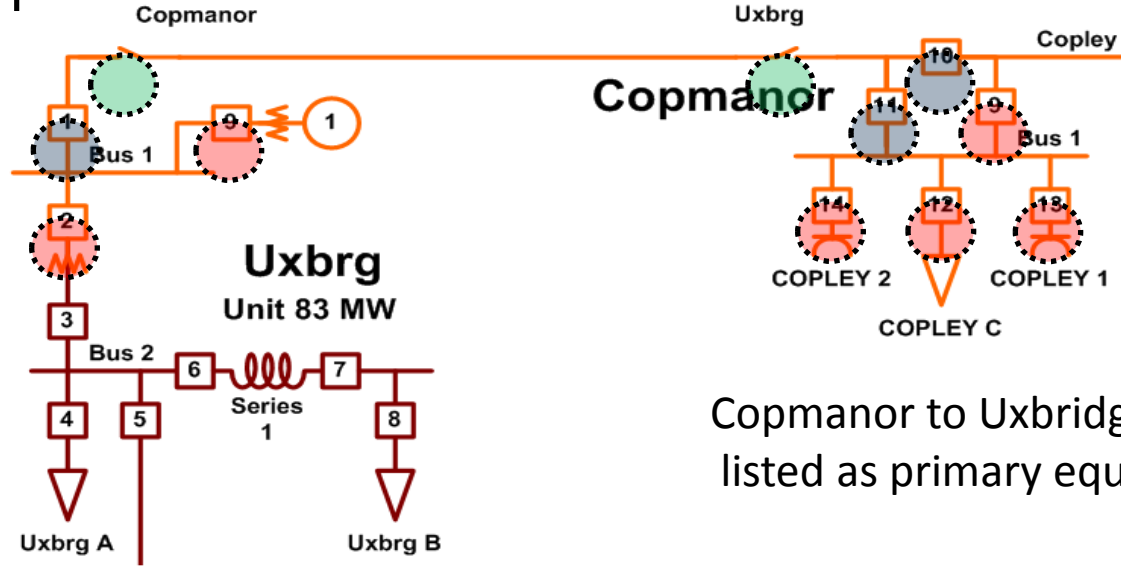
- Outage Type - Indicates when work will be performed on equipment
  - Selectable from: Daily (including weekends), Daily (no weekends), Daily (weekends only), Continuous
- Availability - Time period from when equipment is requested to go back in service to when it is energized
  - Selectable from: Immediate, 30 min, 1 hr., 2 hr., 4 hr., 8 hr., 24 hr., 48 hr., 72 hr. or Duration



- Circuit Breaker Tiers
  - A Tier is defined as a “level” of CB or disconnect clearance for a piece of equipment
  - All CB or disconnect clearance points for an outage must be defined on the outage ticket
    - Tier selection helps accomplish this
  - Each outage ticket is referenced by a “Primary” piece of equipment
    - Tier CB and disconnects are associated with primary equipment
    - Important: Lines are listed by the first (alphabetical) Station Name

- Circuit Breaker Tiers
  - Used to quickly retrieve clearance points (CBs or Disconnects)
  - Limitations on tiers
    - Available for all equipment EXCEPT Busses
    - Will not get clearance points beyond local substations at each end of line
    - Will not get clearance points at voltage levels other than that of the selected line

## Tier Example



Copmanor to Uxbridge line is listed as primary equipment

**Tier 1 shaded green**

**Tier 2 shaded blue (includes tier 1)**


**Tier 3 shaded red (includes tier 1 and 2)**

- Bus Outages
  - No buses modeled explicitly in PJM EMS
  - List breakers that will be open associated with bus
    - Can use tiers to accomplish this quickly
  - Mention BUS outage in Description of Work
  - Only list associated equipment (Lines, transformers) if they are outaged due to bus outage

- Bus Outages
  - Request outage of Plymouth Meeting #3 bus
  - Lines remain energized from remote end
    - The lines will still be included on the ticket



- Viewing or Revising an Existing Transmission Outage Ticket
  - Transmission Outage Ticket is “locked” to changes when the Ticket is Approved
    - In order to make changes or to unlock the form you must first notify PJM verbally
    - If the ticket has a status of Submitted, then any field may be changed

A dark blue, rounded rectangular button with white text that reads 'View/Revise Outage Ticket'.

- Transmission Ticket Status
  - Submitted
    - Original status of ticket upon submittal by company
  - Received
    - Ticket status changed to Received by PJM upon initial review of ticket by Dispatch
    - Notifications sent to other Transmission Owners through eDART

- Transmission Ticket Status (cont.)
  - Denied
    - Ticket status changed to Denied by PJM if outage request is not approved
    - Notifications sent to other Transmission Owners through eDART
      - Verbal notification given to outage submitter
  - Approved
    - Ticket status changed to Approved by PJM if outage request is approved following detailed analysis by Reliability Engineer
    - Ticket is locked to changes
    - Notifications sent to the Transmission Owner and other Transmission Owners that have requested information for this outage through eDART

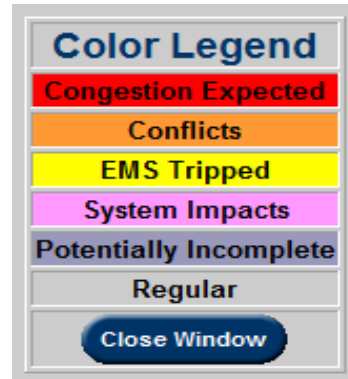


- Transmission Ticket Status (cont.)
  - Cancelled by Company
    - Ticket status changed to Cancelled by Company if company initiates cancellation of ticket
    - Notifications sent to all who had been previously notified through eDART
      - Verbal notification required to PJM if change affects current or next operating day

- Transmission Ticket Status (cont.)
  - PJM Admin Closure
    - Ticket status changed to PJM Admin Closure if PJM initiates cancellation of ticket
    - Notifications sent to all who had been previously notified through eDART
      - PJM gives verbal notification to outage submitter
  - Revised
    - Ticket status changed to Revised if any data on ticket has changed (unless ticket is active)
    - Ticket must be Received and Approved again
      - Notifications resent

- Transmission Ticket Status (cont.)
  - Active
    - Ticket status changed to Active upon input of an actual outage start date by PJM
      - Verbal notification required to PJM at actual start of outage ticket
  - Complete
    - Ticket status changed to Complete upon input of an actual end date by PJM
      - Verbal notification required to PJM at actual end of outage ticket

- Certain types of eDART tickets are given special Color-Coding to identify that they may require additional follow-up or attention
- If an eDART has more than one color status, it will take on the status with the highest color on the chart



## The “Congestion Expected” flag

- PJM will check this flag when a studied outage causes the potential for off-cost operation
- Allows PJM operators to filter these outages out if necessary

**Review/Revise Transmission Ticket**

User: **seminart4** Company: **SBT Trans Comp 4** Status: **Cancelled by PJM** Ticket ID: **62525**

Company Ticket ID:  RTEP Queue #:

Ticket Start		Ticket End		Switch Date	
02/02/05	13:00	02/02/05	17:00	02/02/05	13:00
<small>Date (mm/dd/yy)</small>	<small>Hour (hh24:mi)</small>	<small>Date (mm/dd/yy)</small>	<small>Hour (hh24:mi)</small>	<small>Date (mm/dd/yy)</small>	<small>Hour (hh24:mi)</small>

Location/Description of Work (500 char. max)	Information/Hotline Work	Cause
PJM Comments <div style="border: 1px solid gray; height: 20px; width: 100%;"></div>	<input type="checkbox"/> Emergency <input type="checkbox"/> Vegetation Trip <input type="checkbox"/> Cut In <input type="checkbox"/> Direct Billing <input type="checkbox"/> Direct Billing Decline	<input type="checkbox"/> Add SF-6 Gas <input checked="" type="checkbox"/> C.B. Overhaul <input type="checkbox"/> C.B. Replacement <input type="checkbox"/> CB Maintenance <input type="checkbox"/> Cable Repair <input type="checkbox"/> Contingency Planning <input type="checkbox"/> Cut-in <input type="checkbox"/> Disconnect/Ground Sw. Maintenance <input type="checkbox"/> Double Test <input type="checkbox"/> Emergency <input type="checkbox"/> Excludable Outage <input type="checkbox"/> External <input type="checkbox"/> Fire on Equipment/in Vicinity <input type="checkbox"/> Gas/Oil Testing/Replacement <input type="checkbox"/> High System Voltage
	<input type="checkbox"/> Potentially Incomplete: No <input checked="" type="checkbox"/> Congestion Expected: No <input type="checkbox"/> Submitted On-Time: No <input type="checkbox"/> Market Sensitive: No <input type="checkbox"/> Automatic Re-Close: No	

Outage Type:  Availability:

Tier 1
  Tier 2
  Tier 3

Primary	Status	Include	Type	Station Name	Voltage	Equipment Name	Start Date	Start Hour	End Date	End Hour
<input checked="" type="radio"/>	O	Yes	LINE	CABOT	500 KV	CABOT-KEYSTONE 5002	02/02/05	13:00	02/02/05	17:00
<input type="radio"/>	O	Yes	BRKR	CABOT	500 KV	CABOT CB 06 CB	02/02/05	13:00	02/02/05	17:00
<input type="radio"/>	O	Yes	BRKR	CABOT	500 KV	CABOT CB 05 CB	02/02/05	13:00	02/02/05	17:00
<input type="radio"/>	O	Yes	BRKR	KEYSTONE	500 KV	KEYSTONE DIS 5002	02/02/05	13:00	02/02/05	17:00

Actual Outage Log			
Start Date	Start Hour	End Date	End Hour
02/02/2005	16:09		

- An outage that is suspected to cause congestion will also be highlighted in red when viewed on the “Status Report” page....

**Review/Revise Tickets**

Ticket ID	Company Ticket ID	Ticket Status	Company	Station	Voltage	Equipment	Start Date	End Date	Timestamp	Submit On Time
381086		Cancelled by Company	PPL Electric Utilities Corp. dba PPL Utilities (LSE)	BUSHKILL	230 KV	BUSHKILL-KITTATIN K1019	01/28/2011 08:00	01/28/2011 13:00	07/08/2009 09:26	Yes
381086		Cancelled by Company	PPL Electric Utilities Corp. dba PPL Utilities (LSE)	BUSHKILL	230 KV	BUSHKILL-KITTATIN K1019	01/28/2011 08:00	01/28/2011 13:00	07/08/2009 09:27	Yes

## The “Conflict” Flag

- This functionality looks at eDART tickets to identify outage combinations that should never occur
  - List of scenarios available in eDART
- Some scenarios may be cross-company
- If an outage is submitted violating a scenario, immediate feedback on impacted previously submitted tickets will be provided

Conflicts										
Ticket ID	Company Ticket ID	Ticket Status	Company	Station	Voltage	Equipment	Start Date	End Date	Timestamp	Submit On Time
62900		Conflicted	Energy	SANDUNE	230 KV	SANDUNE LINE 11222	05/10/2011 11:00	05/22/2011 12:00	05/01/2011 12:58	No
62225		Cancelled by Company	Energy	SANDUNE	34 KV	SANDUNE-BNY CB	05/19/2011 11:00	05/23/2011 15:00	05/01/2011 11:15	No

### Review/Revise Transmission Ticket

User: **Electric Company**  
 Status: **Conflict** Ticket ID: **442813**

Company Ticket ID: BGE O/R 44432

Ticket Start	Ticket End	Switch Date
05/19/11 04:00	05/19/11 18:00	05/19/11 04:00
<small>Date (mm/dd/yy) Hour (hh24.mi)</small>	<small>Date (mm/dd/yy) Hour (hh24.mi)</small>	<small>Date (mm/dd/yy) Hour (hh24.mi)</small>

Location/Description of Work (500 characters max)  
MAKE REPAIRS

PJM Comments

Information/Hotline Work

Emergency

Vegetation Trip

Cut In

Congestion Expected: No

Submitted On-Time: No

Market Sensitive: No

**Ticket History**

	TimeStamp	Usr. Name
Submitted	05/17/2011 16:10	
Received	05/17/2011 17:51	
Approval	05/18/2011 10:57	
Latest Revision		

This ticket has been locked by PJM. Please contact dispatch to have this ticket unlocked!

Outage Type	Availability	Cause	Planned:	Operational:
Continuous	4 hr.	Add SF-6 Gas C.B. Overhaul C.B. Replacement CB Maintenance Cable Repair Contingency Planning		

[Print Version](#)
[Date Time Log](#)
[History Log](#)
[Notifications Log](#)
[Duplicate Ticket](#)
[View Conflicts](#)

[Get Outage Lookup](#)
[Comments Log](#)
[Main Menu](#)

Tier 1  Tier 2  Tier 3

Status	Include	Type	Station Name	Voltage	Equip
O	Yes	XFMR	BARNEY	34 KV	BBAR
O	Yes	BRKR	BARNEY	13 KV	BARN

- 'View Conflicts' button available on tickets
- Ticket specific conflicts available for users to see by clicking on the 'View Conflicts' button

### Conflicting Outages Report

[Go to Filter](#)
[Color Legend](#)

Conflict ABC										
Ticket ID	Ticket Status	Company	Type	Station	Voltage	Equipment	Start Date	End Date	Timestamp	Submit On Time
449887	Approved	Energy	LINE	JACKJILL	115 KV	JACKJILL - 1CCR LINE 101	02/16/2012 07:00	02/29/2012 16:00	07/20/2011 12:01	Yes
449889	Approved	Energy	LINE	STPOTPAN	115 KV	STATION - POTPAN 10900 LINE	02/16/2012 07:30	02/28/2012 13:00	07/20/2011 13:00	No
471927	Approved	Energy	LINE	CLAYSBUR	115 KV	CLASBUR-CURRYVIL 1R2R 1099	02/17/2012 08:00	02/17/2012 15:00	02/15/2012 07:28	No

Conflict DEF										
Ticket ID	Ticket Status	Company	Type	Station	Voltage	Equipment	Start Date	End Date	Timestamp	Submit On Time
449887	Approved	Energy	LINE	JACKRCKY	115 KV	JACK 966 JEBAKER 966-1	02/16/2012 07:00	02/29/2012 16:00	07/20/2011 12:01	Yes
471927	Approved	Energy	LINE	CLAYSBUR	115 KV	CLASBUR-CURRYVIL 1R2R 1099	02/17/2012 08:00	02/17/2012 15:00	02/15/2012 07:28	No

[Go to Filter](#)
[Main Menu](#)



## EMS Tripping Tickets

- Tripped equipment (from PJM EMS) automatically creates an eDART outage ticket or activates an existing one for the equipment scheduled for the near future
- All equipment 115kV and above
- Outage type = EMS Tripped
- Ticket has Active status
- Start date/time = time of tripping
- End date/time = Start date/time + 2 hours

- EMS Tripping Tickets created automatically by eDART are given a default cause of “Unknown”
- EMS Trip Update button (on main menu) has the functionality to allow the Transmission Operator to associate cause for the purpose of performance compliance data gathering and to give PJM a better understanding of the reason for the outage
- “Pre-Contingency Switching” checkbox is for the outage being caused by pre-contingency switching

- EMS Trip Update form in Transmission Outage Ticket to allow TO to assign Cause Type to all EMS Trip Tickets marked “Unknown”
- User either selects a Cause Type from drop down or checks “Pre-Contingency Switching”
- Button on Transmission Outage Ticket menu only visible if user’s company has EMS Trip Tickets marked “Unknown”
- Transmission Owner/Operator is expected to update ticket if “EMS Trip Update” Button is shown

Transmission Outage Main Menu

Create New  
Outage Ticket

View/Revise  
Outage Ticket

EMS Trip  
Update

EMS Trip Update

Ticket Status: Submitted  Planned  Received  Approved  Revised  Active  Cancelled  Completed

Apply Filter

Ticket ID	Company Ticket ID	Ticket Status	Station	Voltage	Equipment	Start Date	End Date	Cause	Contingency Planning
127962		Active	MONTEVILL	230 KV	MNT-NEW	09/19/2006	10/19/2006	Unknown	<input checked="" type="checkbox"/>
128060		Active	HUMMELST	230 KV	HUM-NHE	09/21/2006	10/23/2006	Repair/Replace Conductor	<input type="checkbox"/>
128065		Active	GREYSTON	230 KV	GRE-WWH	09/21/2006	10/23/2006	Repair/Replace Insulator	<input type="checkbox"/>
129743		Active	ATLANTIC	230 KV	3TRAN	10/14/2006	10/14/2006	Fire on Equipment/in Vicinity	<input type="checkbox"/>
129744		Active	TMI	230 KV	1B TX 2	10/14/2006	10/14/2006	Unknown	<input checked="" type="checkbox"/>

Submit Form
Main Menu

## “System Impact” flag

- PJM has the capability to permanently link comments to specific equipment outages in eDART
  - Allows the Reliability Engineers to pre-screen outages based on known impacts to generation, thermal overloads, voltage violations, stability restrictions, etc. before studying the outage
  - Serves a reminder for the PJM folks, could be useful to the TOs as well.
  - Outages that have System Impact notes available will be highlighted in purple on the “Status Report” page

Ticket ID	Company Ticket ID	Ticket Status	Outage Type	Company	Station	Voltage	Equipment	Start Date	End Date	Timestamp	Submit On Time
<a href="#">82169</a>		Approved	Daily - Weekends Only	PJM TEST	BOONEDAM	4 KV	C-T	09/09/2009 00:00	10/10/2009 00:00		Yes
<a href="#">209593</a>		Received	Continuous	PJM TEST	02ACUST	138 KV	95	05/12/2009 00:00	05/14/2009 00:00		No
<a href="#">209596</a>		Approved	Continuous - No Weekends	PJM TEST	02ACUST	138 KV	95	06/04/2009 00:00	06/19/2009 00:00		No
<a href="#">212464</a>	JordanPJMTESTest	Approved	Continuous	PJM TEST	CROMBY	230 KV	CRO-LIM0	12/04/2011 09:25	12/10/2011 09:30	12/01/2011 09:08	No

- The eDART ticket for those outages will have an additional button labeled “System Impacts”

**Review/Revise Transmission Ticket**

User: **egbuoc** Company: **PJM TEST** Status: **Approved** Ticket ID: **209596**

Company Ticket ID:  RTEP Queue #:

Ticket Start:  Ticket End:  Switch Date:

Date (mm/dd/yyyy) Hour (hh:mm) Date (mm/dd/yyyy) Hour (hh:mm) Date (mm/dd/yyyy) Hour (hh:mm)

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

PJM Comments  
Testing

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 (Lookup)  
 Construction: Antenna  
 Construction: New Equipment  
 Cut In  
 External  
 Maintenance: CB  
 Maintenance: CVT / Wave Trap  
 Maintenance: Cable  
 Maintenance: Conductor  
 Maintenance: Disco/Ground Sw  
 Maintenance: Gas (SF6)  
 Maintenance: Gas/Oil  
 Maintenance: Inspection / General Maintenance  
 Maintenance: Normally Open  
 Maintenance: Transformer  
 Maintenance: Vegetation

Ticket History

	Time Stamp	Utr. Name
Submitted		
Received		
Approval		
Latest Revision		

Outage Type:  Availability:  NERC-TADS:

Type:  Station Name:  Voltage:  Equipment Name:  Operational:

Print Version Date Time Log History Log Notifications Log Cancel Ticket Duplicate Ticket View Conflicts Gen Off Conflicts Show All TDRs

System Impacts Gen. Outage Lookup Comments Log NERC-TADS Reports Projects Files Main Menu

Default Status Change Only	Primary	Status	Include	Type	Station Name	Voltage	Equipment Name	Start Date	Start Hour	End Date	End Hour	Resulting Default Status
No	<input type="radio"/>	O	<input type="checkbox"/>	BRKR	02ACUST	138 KV	02ACUST 95 CB	06/04/2009	00:00	06/19/2009	00:00	No Change

- Clicking on the “System Impacts” button will bring up a screen detailing the linked comments

Transmission Ticket System Impacts	
Ticket ID: <a href="#">427008</a>	
Title	Comments
Holtwood-Face Rock 696 Span Limits	If the 696 span is out of service, determine how many Holtwood units may be online based on the limits of the
<a href="#">Close Window</a>	

## The “Potentially Incomplete” flag

- Added to transmission outage tickets to flag tickets that may need further review by PJM
- Potentially Incomplete is flagged if:
  - All outaged equipment in the ticket are breakers and the ticket is not Information/Hotline Work
  - Location/Description of Work field needs more information
- PJM will determine if non-BRKR facility should be added or more description text is necessary
  - Ex. For Ticket where BRKR on either side submitted w/o submitting LINE, have company add LINE to the ticket

- Potentially incomplete ticket can be Cancelled or Denied but no other status change is allowed until Potentially Incomplete is unchecked
- PJM can remove flag once issue resolved and continue normal status change
- Potentially Incomplete tickets will be highlighted in Lavender



- PJM Comments automatically added when a ticket is flagged as Potentially Incomplete
  - If Location/Description of Work field has less than a pre-determined number of characters:
    - PJM Comments = "Please include additional information in the work description"
  - If all outaged equipment in the ticket are breakers and the ticket is not Information/Hotline Work:
    - PJM Comments = "Please include applicable non-BRKR facilities"
- Both comments are added if both of the conditions above persist

- EMS Tripping -vs- Potentially Incomplete:
  - EMS Tripped process overrides Potentially Incomplete logic to activate previously submitted tickets
  - If EMS Tripped process is activating a ticket currently in the Submitted status and Potentially Incomplete is TRUE, it will also set the Potentially Incomplete flag to FALSE

- Outage planning and Weather
- Outage Reporting Guidelines
- eDART
- **Communications and Notifications**

- Communications
  - Verbal Notification required to PJM for:
    - Any change to ticket (dates, equipment) which affects the current or next operating day
    - Transmission trippings
      - Also submit an outage ticket
      - If return date is unknown, use end of estimated month at 23:59
    - Switching, when it is ready to begin
      - To allow PJM to perform final reliability studies
    - Actual start and end time of outage tickets
      - PJM will then update the ticket in eDART
    - Problems with entering tickets through eDART

- Communication Guidelines
  - Verbal Notification will be given from PJM for:
    - Denial or cancellation of outage request
    - Questions about submitted outage request
    - Any special requirements for outage
    - 500 kV and above switching messages
      - via All-Call

- Notifications - Receiving
  - Notifications will be made based on updated Reportable Transmission Facilities list
    - Notifications can be found in eDART
  - eDART will allow those who are notified to view Transmission Outage Tickets
  - Notifications must be acknowledged by receiving company through eDART

- Real Time Outage Communication Process
  - **PJM Member Company Actions**
    - Notifies PJM System Operator verbally 1/2 hour prior to scheduled outage of any Designated Transmission Facility
    - If 500 kV or above outage, notifies PJM again verbally, just prior to switching to verify conditions
    - Notifies PJM verbally when facility is out of service
    - Ensures that outaged facilities are properly represented in real-time system models

- Real Time Outage Communication Process
  - **PJM Actions**
    - Verifies outage will not adversely impact Control Area reliability
    - If 500 kV or above, notifies other PJM Member Companies of outage via All-Call
    - Notifies other affected Control Areas verbally



- Overview on navigating eDART in order to create or edit transmission tickets
- Communication and Notifications associated with eDART that will be utilized when necessary