

M-03 Revision 38

Key Changes

5/17/2011

Overall changes:

- Revise *Table Style Sets* to current PJM web standards. **(REVISED)**

BKR	Temp. °F	24 Hr	4 Hr	½ Hr	¼ Hr
Mt Storm					
500 kV '55072'	95	2650	2676	2676	3005
	86	2728	2754	2754	3092
	77	2806	2832	2832	3196
	68	2858	2884	2884	3300
	59	2936	2962	2962	3377

BKR	Temp. °F	NL	LT	ST	LD
Mt Storm					
500 kV '55072'	95	2650	2676	2676	3005
	86	2728	2754	2754	3092
	77	2806	2832	2832	3196
	68	2858	2884	2884	3300
	59	2936	2962	2962	3377

- Revise all *Single Breaker Derate* tables within Section 5 to utilize 'NL', 'EM', 'LT', 'ST', and/or 'LD' for ratings limits where appropriate. **(REVISED)**

Section 1.3: *Transmission Operating Guidelines* Note (**NEW**)

Note: PJM Transmission Owners that own BES facilities and serve load greater than 300 MW must have a real-time analysis package or have their BES facilities be observable within another TO analysis package.

- RT Analysis requirement for TOs with BES an >300MW load

Section 2, end: *Thermal Operating Guidelines* (**REVISED**)

Thermal Limit Exceeded	If Actual loading exceeds limit	Time to correct
Normal Flow Greater than Normal Rating but Less than Emergency Ratings (LTE and STE)	Use all effective action(s) and emergency procedures except load dump.	15 minutes
Long Term Emergency Flow Greater than LTE Rating but Less than STE rating	All of the above plus, dump load to control violation below LTE.	15 minutes (30 minutes to shed load) See Note1 & Note2 below.
Short Term Emergency Flow Greater than STE Rating but Less than LD Rating	All of the above plus, dump load to control violation below LTE.	15 minutes See Note1 & Note3 below.
Load Dump Flow Greater than LD Rating	All of the above plus, dump load to control violation below Emergency Rating.	5 minutes See Note1 below.

Exhibit 1: PJM Actual Overload Thermal Operating Policy

Thermal Limit Exceeded	If Post-Contingency simulated loading exceeds limit	Time to correct
Normal	Trend – continue to monitor. Take non-cost actions to prevent contingency from exceeding emergency limit.	N/A
Emergency	Use all effective actions and emergency procedures except load dump.	30 minutes
Load Dump	All of the above however, shed load only if necessary to avoid post-contingency cascading.	30 minutes

Exhibit 2: PJM Post-Contingency Simulated Thermal Operating Policy

- Tables changed from Guidelines to Policy
- Distinction between EM ratings (LTE/STE) added for Actual Overloads

Section 2, end: *Thermal Operating Guidelines* (**REVISED**)

Note1: TO must dump load without delay upon receipt of [PJM Directive](#) to dump load.

Note2: "Time to Correct" for facilities that have an STE rating documented within Manual 3, and have flow greater than LTE rating but less than STE rating must control loadings below their LTE rating consistent with the duration of their STE rating (i.e. 2 hours, 1 hour or 30 minutes). As time permits, PJM and TO shall discuss the basis for the STE rating duration to determine if the rating permits flows to violate the LTE rating for more than 30 minutes without load shed.

Note3: Any facility where LTE=STE, or with no documented STE rating, would be considered to be exceeding the STE and thus has 15 minutes to reduce below the LTE rating via Off-Cost, Non-Cost and Load Shedding.

- Notes (1-3) added for Actual Overloads distinction and referencing new PJM Directive procedure

Section 3.2, end: *Voltage Operating Criteria & Guidelines* (REVISED)

The following chart details PJM's Voltage Operating Policy for an actual violation.

Voltage Limit Exceeded	If Actual voltage limits are violated	Time to correct (minutes)
High Voltage	Use all effective non-cost and off-cost actions.	Immediate
Normal Low	Use all effective non-cost actions, off-cost actions, and emergency procedures except load dump.	15 minutes
Emergency Low	All of the above plus, shed load if voltages are decaying.	5 minutes
Load Dump Low	All of the above plus, shed load if analysis indicates the potential for a voltage collapse.	Immediate
Transfer Limit Warning Point (95%)	Use all effective non-cost actions. Prepare for off-cost actions. Prepare for emergency procedures except load dump.	Not applicable
Transfer Limit	All of the above, plus shed load if analysis indicates the potential for a voltage collapse.	15 minutes or less depending on the severity

The following chart details PJM's Voltage Operating Policy for a Post-Contingency Simulated Operation.

Voltage Limit Exceeded	If post contingency simulated voltage limits are violated	Time to correct (minutes)
High Voltage	Use all effective non-cost actions.	30 minutes
Normal Low	Use all effective non-cost actions.	Not applicable
Emergency Low	Use all effective non-cost actions, off-cost actions, and emergency procedures except load dump.	15 minutes
Load Dump Low	All of the above plus, shed load if analysis indicates the potential for a voltage collapse.	5 minutes
Voltage Drop Warning	Use all effective non-cost actions.	Not applicable
Voltage Drop Violation	All effective non-cost and off-cost actions plus, shed load if analysis indicates the potential for a voltage collapse.	15 minutes

- Tables changed from Guidelines to Policy

Section 3.3.3:

- *Generator Voltage Schedules* (**REVISED**)
 - Bandwidth was being misinterpreted as a % by some generators in the Schedule table.
 - Revise to indicate '(kV)' for the Schedule and Bandwidth rows.

Section 3.8:

- *Transfer Limits* (**REVISED**)
 - Reformatted for clarity
 - Mt Storm – Meadowbrook 500kV line added to APSouth (Estimated in service of 6/1/2011)
 - CLVLND reactive interface added (Effective 6/1/2011.)

Section 3.8:

- Transfer Limits* (**REVISED**)

Transfer Interface	Interface Definition
Eastern (Eastern)	<ul style="list-style-type: none"> 5044 Wescosville – Alburdis 500kV line 5009 Juniata – Alburdis 500kV line 5026 TMI – Hosensack 500kV line 5010 Peach Bottom – Limerick 500kV line 5025 Rock Springs – Keeney 500kV line
Central (Central)	<ul style="list-style-type: none"> 5004 Keystone – Juniata 500kV line 5005 Conemaugh – Juniata 500kV line 5012 Conastone – Peach Bottom 500kV line
5004/5005 (5004/5005)	<ul style="list-style-type: none"> 5004 Keystone – Juniata 500kV line 5005 Conemaugh – Juniata 500kV line

Western (Western)	<ul style="list-style-type: none"> 5004 Keystone – Juniata 500kV line 5005 Conemaugh – Juniata 500kV line 5006 Conemaugh – Hunterstown 500kV line 5055 / 522 Doubs – Brighton 500kV line
Bedington – Black Oak (Bed-BlA)	<ul style="list-style-type: none"> 544 Black Oak – Bedington 500kV line
AP South (AP South)	<ul style="list-style-type: none"> 512 Mt Storm – Doubs 500kV line 540 Greenland Gap – Meadowbrook 500kV line 550 Mt Storm – Valley 500kV line Mt Storm – Meadowbrook (TrAIL) 500kV line <i>(Estimated In-Service Date of June 1, 2011)</i>
AEP - Dominion (AEP-DOM)	<ul style="list-style-type: none"> Kanawha River – Matt Funk 345kV line Wyoming – Jacksons Ferry 765kV line Baker – Broadford 765kV line
Cleveland (CLVLND) Effective upon ATSI/PPP Integration, 6/1/2011.	<ul style="list-style-type: none"> 345kV Chamberlin – Harding 345kV line Hanna – Juniper 345kV line Star – Juniper 345kV line Davis Besse – Beaver 345kV line Carlisle – Beaver 345kV line Erie West – Ashtabula 345kV line Ford – Beaver 138kV line Greenfield – Beaver 138kV line NASA – Beaver 138kV line Camden – Beaver 138kV line West Akron – Hickory 138kV line West Akron – Brush 138kV line Johnson – Beaver 138kV line Edgewater – Beaver 138kV line Johnson – Lorain 138kV line National - Lorain 138kV line

Section 3.9:

- *Variations to PJM Base Line Voltage Limits* (**REVISED**)
 - UGI's 69kV voltage limits added (operate at 66kV)
 - ATSI added at 345kV, 138kV & 69kV voltage levels
 - CPP added at 138kV & 69kV voltage levels
 - ATSI & CPP limits effective on 6/1/2011

Section 4.2.6:

- *Peak Period Outage Scheduling* (**NEW**)
 - Mid-Term Operations Planning
 - Defines the Peak Periods as 6/15 to 8/31 AND 1/1 to 2/28.
 - Any outages that are > 5 days with no or > 5 days of restoration time and that may result in an increased risk to system reliability should be avoided during the Peak Periods. Including:
 - 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.

Section 4.5:

- *Transmission Outage Acceleration Process* (**REVISE**)
 - Clarifications provided
 - Manual Alignment applied
 - Includes Tariff Language

Section 5, **PJM RTO** Ops:

- *Voltage Control at Nuclear Stations* (**REVISED**)
 - Revised limits for Dresden 2 & 3 as per NPIR
 - Added ATSI units, Perry & Davis-Besse

Section 5, **AE** Transmission Zone Ops:

- *Directional Ratings* (**NEW**)

Line	kV	From Bus	To Bus	Summer		Winter	
				NL	EM	NL	EM
Monroe – Williamstown Tap 0716-1	69	Williamstown Tap	Monroe	123	158	142	178
Clayton – Williamstown Tap 0716-2	69	Williamstown Tap	Clayton	99	111	107	120
Beckett – Deepwater 0722-1	69	Beckett	Deepwater	119	144	142	173
Corson – Union 1402	138	Union	Corson	390	442	442	442

Section 5, **AEP** Transmission Zone Ops:

- *Single Breaker Derates* (**NEW**)
- *Smith Mountain 138kV Station Stability* (**REVISED**)
 - Reflects upgrades at Smith Mountain
- *Rockport Operating Guide* (**REVISED**)
 - Calls out Fast Valving (FV) and Emergency Unit Trip (EUT) as specific Special Protection Schemes [SPS] within the guide

Section 5, **AEP** Transmission Zone Ops:

- *Twin Branch – Argenta (Conservative Operations)*
(**REVISED**)
 - Added **reference to** 2010-S-027-E, MISO Standing Operating Guide.
 - Defines potential IROL condition and limitation
 - Any increased probability of a Double Tower contingency for simultaneous loss of Cook-Palisades & Benton Harbor – Palisades.
 - > 30 minute voltage collapse or LD limit violation on a contingency basis

Section 5, AP Transmission Zone Ops:

- 138kV Bus Voltage Exceptions (**NEW**)

Special Voltage Limits

	High	Low	Emergency Low	Load Dump
Baker		130.0	126.0	122.0 *
Charleroi		128.0	124.0	121.0
Cherry Run		128.0	124.0	121.0
Edgelawn		128.0	124.0	121.0
Goff Run		128.0	124.0	121.0
Grand Point		128.0	124.0	121.0
Grassy Falls		128.0	124.0	121.0
Hardy		130.0	126.0	122.0 *
Kams City		128.0	124.0	121.0
Keisters		128.0	124.0	121.0
Kittanning		128.0	124.0	121.0
Kiski Valley		128.0	124.0	121.0
Krendale		128.0	124.0	121.0
North Petersburg		130.0	126.0	122.0 *
Peters		128.0	124.0	121.0
Seneca Cavems		130.0	126.0	122.0 *
Social Hall		128.0	124.0	121.0
Springdale		128.0	124.0	121.0
Trissler		128.0	124.0	121.0

ZONE	230 kV					138 kV				
	LD	EL	NL	NH	Drop	LD	EL	NL	NH	Drop
PJM	207 0.90	212 0.92	219 0.95	242 1.05	5-8%	124 0.90	127 0.92	131 0.95	145 1.05	5-10%
PS	*	218.5	225.5	*	*	*	131	135	*	*
PE	213.5	218.5	225.5	242	7	128	131	135	145	7
PL	*	*	*	*	*	*	*	*	*	*
UGI	*	*	*	*	*					
BC	*	*	*	*	*					
JC	*	*	*	*	*					
ME	*	*	*	*	*	*	*	*	*	*
PN	*	*	*	*	*	*	*	*	*	*
PEP	*	*	*	*	*	*	*	*	*	*
AP	*	*	*	*	*	121	124	128	*	8

Table from end of Section 3

Bus	138 kV		
	LD	EL	NL
Baker	122.0	126.0	130.0
Hardy	122.0	126.0	130.0
North Petersburg	122.0	126.0	130.0
Seneca Caverns	122.0	126.0	130.0

Exceptions called out within Section 5 AP Operating Procedure

Section 5, **AP** Transmission Zone Ops:

- *Belmont SPS* (**REVISED**)
 - Formerly called *Pleasants and Oak Grove Operating Restrictions*
 - Revised to SPS due to redundancy added to the preexisting relay scheme
- *Breaker Derate Table* (**REVISED**)
 - Single Breaker Derate rating sets revised for Bedington, Belmont, Black Oak, Cabot, Doubs, Ft Martin, Harrison, Hatfield, Meadowbrook, Pruntytown, South Bend, Wylie Ridge & Yukon 500kV CBs

Section 5, **ATSI** Transmission Zone Ops:

- FE-ATSI Transmission Zone Operating Procedures added as part of ATSI/CPP integration, effective 6/1/2011. (**NEW**)
- *Mansfield Unit Stability Restrictions* (**NEW**)
 - Requires reduction to two boiler feed pump minimum load for any Mansfield unit connected to only one transmission line or connected to a bus that is connected to only one transmission line to safeguard against system instability
- *Richland Substation [SPS]* (**NEW**)
 - Trips 1 to 3 Richland units for overloads of the *Richland 13247 K-L 138kV Bus Tie CB* and/or the *Richland – Naomi Junction – Midway – Wauseon 138kV line*.

Section 5, **BC** Transmission Zone Ops:

- *Breaker Derate Table* (**REVISED**)
 - Single Breaker Derate rating sets revised for Waugh Chapel – Calvert Cliffs '5052' ling associated 500kV CBs

Section 5, **ComEd** Transmission Zone Ops:

- Removed references to retired SPOGs 1-3-C-1, 1-3-I-1 and 1-8 from ComEd operating procedures (**REVISED**)
- *107_Dixon 'L 15621' 138kV CB Operation* (**REMOVED**)
 - as SPOG 3-21 is retired.
- *Elmhurst SVC* (**REVISED**)
 - Defined Operation Modes (Automatic, Fixed Susceptance, External Device Control, 138kV Capacitor).

Section 5, **ComEd** Transmission Zone Ops:

- *Wolfs TR81 [SPS] (NEW)*
 - Opens the Wolfs TR81 whenever 345kV line 14321 is opened at Electric Junction
- *Electric Junction – North Aurora 138kV 11106 [SPS] (NEW)*
 - Initiates transfer trip at N Aurora on line 11106 for an open CB at Electric Junction
- *Highland Park Transfer Trip [SPS] (NEW)*
 - Initiates transfer trip on line 15912 at Northbrook (back-up @ Highland Park) for bus 2 outage @ Northbrook
 - Initiates transfer trip on line 15913 at Northbrook (back-up @ Highland Park) for bus 3 / 4 outage @ Northbrook

Section 5, **ComEd** Transmission Zone Ops:

- *Zion Generation Stability Trip [SPS] (NEW)*
 - Trips Zion Unit #2 for selected faults to prevent instability
- *Camp Grove Islanding (NEW)*
 - Switching required to prevent potential islanding of Camp Grove wind farm into Powerton station during outages of the Powerton-Havana-Lilly or Toulon – Kewanee 138kV lines
- *Wolfs Crossing – Sandwich 138kV 14302 line [SPS] (REVISED)*
 - Was named Sandwich 138kV Bus Tie Circuit Breaker [SPS]
 - Due to changes with SPS and applicable SPOG 3-31

Section 5, **DLCO** Transmission Zone Ops:

- *Elrama 138/69kV Auto Transformer Operation*
(**REMOVED**)
 - Removed due to transformer replacement

Section 5, **DPL** Transmission Zone Ops:

- *DPL Transmission Zone Operating Procedure* section added (**NEW**)
- *Directional Ratings* (**NEW**)

Line	kV	From Bus	To Bus	Summer		Winter	
				NL	EM	NL	EM
Indian River – Robisonville 13705	138	Indian River	Robisonville	275	336	317	381

Section 5, **FE** (PN, ME, JC) Transmission Zone Ops:

- *TMI Voltage Notification Procedures* (**REMOVED**)
 - Removed as the limits for 1 Aux and 2 Aux Transformers are now identical.
- *Conemaugh/Hunterstown Unit Stability* (**REVISED**)
 - Was Conemaugh Unit Stability .. Added restrictions to Hunterstown and Conemaugh combined.
 - Using latest stability guide from Planning
- *Homer City Stability Limits* (**NEW**)
 - Added net MW output restrictions to Homer City 1, 2 & 3 based upon various transmission outages and generation patterns.

Section 5, **PE** Transmission Zone Ops:

- *Peach Bottom '45' 500kV CB SPS* (**REVISED**)
- *Peach Bottom '35' 500kV CB SPS* (**REVISED**)
 - Revised normal status to 'Disabled; And, Enabled as needed' for both SPS.

Section 5, **PEPCO** Transmission Zone Ops:

- *Common Trench Ratings* (**REVISE**)
 - Ratings for 2 new 69kV lines from Benning to 12th&Irving

Section 5, **PL** Transmission Zone Ops:

- *Hosensack – Buxmont 230kV Line Contingency* (**REMOVED**)
 - Scheme is no longer required and has been disabled.
- *Montour Stability Restrictions* (**REVISED**)
 - Table revised to remove outage restrictions to Montour #1 based upon North or South Bus outages @ Montour.

Section 5, **PS** Transmission Zone Ops:

- *Breaker Derate Table* (**REVISED**)
 - SBD removed associated with select CBs at Branchburg, New Freedom, Trenton & Linden.
 - SBD added for 500kV '2-6' & '5-6' CBs @ Deans.
 - Revised SBD for 500kV '1-3' CB @ Hope Creek.

Section 5, **UGI** Transmission Zone Ops:

- *Hunlock Outlet Overloads* (**REMOVED**)
 - Removed due to area upgrades.
- *Operation of 230kV Tie at Mountain* (**REVISED**)
 - Revised to reflect area upgrades.
- *UGI/PL 66kV Tie Line Operation* (**REVISED**)
 - Revised to reflect area upgrades.

Section 5, **VP** Transmission Zone Ops:

- *Clover Generation Shed Scheme [SPS] (REVISED)*
 - Clearly identified as an SPS.

Attachment B, Open Circuit Terminal Voltage Control:

- Extensive table revision PJM EHV lines. (**REVISED**)

Attachment E, Automatic Sectionalizing Schemes:

- *PPL Transmission Zone* (**NEW**)
- *UGI Transmission Zone* (**NEW**)
- *AEP Transmission Zone* (**REVISED**)
 - Removed three Auto-sectionalizing Schemes related to the Matt Funk 345kV due to system upgrades.