Manual Revisions
PJM EMS Upgrade Manual Documentation

Adamy Garcia – EMS Technologies
Becky Davis – NERC Compliance
Markets & Reliability Committee
March 22, 2023

NERC Certification

PJM is receiving a Certification Review because:

- PJM is modifying its Energy Management System (EMS)
  - Provides reasonable assurance an already certified and operational Registered Entity will continue to support reliable operations of the Bulk-Power System (BPS) after initiating a material change.
  - NERC RoP Section 500 and Appendix 5A Govern Certifications
    - NERC RoP Section 500 pages 41-52: https://www.nerc.com/AboutNERC/RulesOfProcedure/NERC%20ROP%20effective%20202208 25_no%20appendicies.pdf
    - NERC Appendix 5A Organization Registration and Certification Manual: https://www.nerc.com/AboutNERC/RulesOfProcedure/Appendix%205A%20effective%2020210 119.pdf

NERC Certification

Certification Reviews are an effort to continue to endorse entities registered as BAs, TOPs and RCs that were previously certified by the Region and NERC following a 'triggering' event (i.e. Material Change).

- Evaluate the entity's Reliability Standard based **capabilities** associated with the registered functions.
- Used to gain **reasonable assurance** that the entity has the processes, procedures, tools, training, and personnel in place to continue to reliably perform the registered functions following a 'triggering' event (i.e. Material Change).

Information taken from a Texas RE/NERC Certification Best Practices and Activities Review:
https://www.texasre.org/Documents/Presentations/Talk%20with%20Texas%20RE/Talk%20with%20Texas%20RE%20-Certification%20Best%20Practices%20and%20Activities%20Review.pdf

NERC Certification & Manual Revisions

- Most PJM Manuals include EMS references at a high level and do not include vendor specific information and/or displays.

- Three Manuals will be revised to remove specific EMS vendor information:
  - Manual-01 Control Center and Data Exchange Requirements
  - Manual-13 Emergency Operations
  - Manual-36 System Restoration

Manual 01 Revision:

- Section 1.1 Energy Management System (EMS)
  - Four separate references to PCT, Process Control Test System to be replaced with QAS, Quality Assurance System. Functionally similar but vendor terminology difference.
  - Two separate references to CFE, Communications Front End to be replaced with FEP, Front End Processor. Functionally similar but vendor terminology difference.

Manual-13 Emergency Operations

Manual 13 revision:

- Attachment E: Manual Load Dump Allocation Tables

Current Display Revision 86

LOAD DUMP ALLOCATION — AGC

	RTO	MID-ATL	AP	AEP	DAY	DLCO	CE	DOM	FE	DEOK	EKPC
+ Net Zone Generation	101550	36200	6864	16881	2905	1479	15922	12073	5644	2166	1417
+ Load Share Ratio Gen Pseudo-Ties	2430	894	154	340	77	44	296	327	193	65	39
+ Load Share Ratio Gen Dynamic Schedules	333	-6	0	0	0	0	3	80	0	256	0
+ Active Zone Reserve Share Energy	0	0	0	0	0	0	0	0	0	0	0
+ Net Zone LSE ExSchedules	0	0	0	0	0	0	0	0	0	0	0
+ Load Share Ratio RTO Energy Schedules	10	4	1	1	0	0	1	1	1	0	0
- Net Zone Load	101086	37194	6409	14158	3210	1850	12298	13621	8019	2701	1625
= Net Zone Energy Position (A)	3236	-103	609	3065	-228	-326	3924	-1140	-2181	-215	-169
Net Zone Capacity Position (B)	-4494	-2338	1277	-3737	179	360	-2356	-3869	4290	2340	-640
Net Zone Position (A + B)	-1258	-2441	1886	-672	-49	34	1568	-5009	2109	2125	-809
Zone Positions		SHORT	EXCESS	SHORT	SHORT	EXCESS	EXCESS	SHORT	EXCESS	EXCESS	SHORT
Desired Load Dump Amount	1000										
Load Dump Allocation		272	0	75	5	0	0	558	0	0	90

New Display Revision 87

Load Dump Allocation

Zone Energy Position									Zone Capacity Position	Zone Position		Load Dump	
Zone Name	+ Net Zone Generation	+ Load Share Ratio Gen Pseudo-Ties	+ Load Share Ratio Gen Dynamic Schedules	+ Active Zone Reserve Share Energy	+ Net Zone LSE ExSchedules	+ Load Share Ratio RTO Energy Schedules	- Net Zone Load	= Net Zone Energy Position (A)	Net Zone Capacity Position (B)	Net Zone Position (A+B)	Zone Position	Desired Load Dump	Load Dump Allocation
RTO	102144	910	66	0	71	-5351	97768	164	680	844		650	
Allegheny	6954	59	4	0	0	-347	6329	41	60	101	EXCESS	0	0
COMED	16876	108	8	0	0	-633	11563	4595	2598	7193	EXCESS		0
Duquesne	1354	14	1	0	0	-82	1489	439	873	1312	EXCESS		0
Dominion	13489	131	10	0	0	-768	14315	-1144	-4238	-5382	SHORT	0	348
AEP	20068	166	11	0	0	-879	16348	3292	-6337	-3045	SHORT		197
EKPC	964	16	1	0	71	-91	1985	-704	-246	-950	SHORT		62
First Energy	6467	86	6	0	0	-468	8547	-2464	3537	1073	EXCESS	0	0
Dayton	-21	21	2	0	0	-124	2265	-2388	2492	104	EXCESS		0
Mid-Atlantic	34416	304	22	0	0	-1788	32542	313	-974	-661	SHORT		43
Duke Energy	1437	29	2	0	0	-171	3114	-1816	2915	1099	EXCESS	0	0

Manual 36 Revision

- Section 3.1.7 PJM Assumes Balancing Authority Role

3.1.7 PJM Assumes Balancing Authority Role

During a system restoration, interconnected Transmission Owners will balance their own islanded areas. This occurs by the largest area controlling frequency and the smaller areas controlling tie line flow. This section describes the operating process and criteria for transferring operations back the PJM (Balancing Authority) in accordance with PJM's (Reliability Coordinator) criteria (per EOP-005-3 R1.9 and EOP-006-3 R1.6).

The PJM EMS has the capability of calculating and monitoring ACE for up to ~~five~~ ten internal islanded areas or subsystems connected to the Eastern Interconnection. This assumes that PJM has sufficient monitoring in these subsystems (including frequency monitoring and tie line monitoring). Once PJM verifies accurate data and ACE calculation within a subsystem, PJM will coordinate with the Transmission Owners within the subsystem and when appropriate resume

Changed from five to ten

Timeline

Contact

SME/Presenters:

Adamy Garcia

Adamy.Garcia@pjm.com

Elizabeth (Becky) Davis

Elizabeth.Davis@pjm.com

Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com

PROTECT THE POWER GRID

THINK BEFORE YOU CLICK!

Be alert to malicious phishing emails.

Report suspicious email activity to PJM.

(610) 666-2244 / it_ops_ctr_shift@pjm.com