

FERC Order 881

vermont electric power company



May 2022

Transmission Line ratings

How do we rate our transmission assets today:

- Static thermal ratings based on IEEE calculations utilizing ISO-NE PP7
 - NORM, LTE, STE, DAL
 - 2 seasonal ratings; Winter and Summer
- Socialized via the ISO-NE NX Database

FERC Order 881 on AAR - Transmission Line Ratings

AWG gauge	Conductor Diameter inches	Conductor Diameter mm	Ohms per 1000 ft.	Ohms per km	Maximum amps for chassis wiring	Maximum amps for power transmission	Maximum frequency for 100% skin depth for solid conductor copper	Breaking force Soft Annealed Cu 37000 PSI
0000	0.46	11.684	0.049	0.16072	380	302	125 Hz	6120 lbs
000	0.4096	10.40384	0.0618	0.202704	328	239	160 Hz	4860 lbs
00	0.3648	9.26592	0.0779	0.255512	283	190	200 Hz	3860 lbs
0	0.3249	8.25246	0.0983	0.322424	245	150	250 Hz	3060 lbs
1	0.2893	7.34822	0.1239	0.406392	211	119	325 Hz	2430 lbs
2	0.2576	6.54304	0.1563	0.512664	181	94	410 Hz	1930 lbs
3	0.2294	5.82676	0.197	0.64616	158	75	500 Hz	1530 lbs
4	0.2043	5.18922	0.2485	0.81508	135	60	650 Hz	1210 lbs
5	0.1819	4.62026	0.3133	1.027624	118	47	810 Hz	960 lbs
6	0.162	4.1148	0.3951	1.295928	101	37	1100 Hz	760 lbs
7	0.1443	3.66522	0.4962	1.634096	89	30	1300 Hz	605 lbs
8	0.1285	3.2639	0.6282	2.060496	73	24	1650 Hz	480 lbs

- FERC Order issued Dec 16, 2021
- Compliance obligation due July 12, 2022
- We have 3 years to comply with the order
- Desire of Order is to unlock congested generation

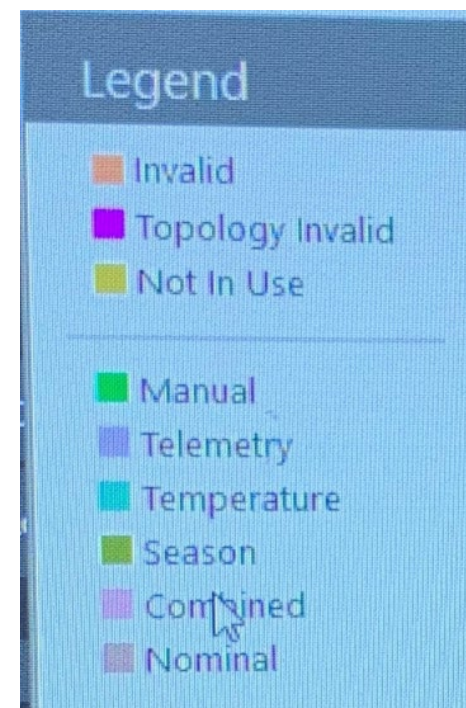
FERC Order 881 Transmission Owner requirements



- Requirements of Order for transmission ratings:
 - At least 4 seasonal ratings
 - Ratings updated at least hourly based on real-time & forecasted ambient temperatures
 - Require methodology must account for historical temperatures +/- 10 °F with granularity of at least every 5 °F
 - Day vs night time ratings
 - Transmission service requests require 10 day look ahead
 - The effect of Solar radiation (heating) needs to be taken into account.
 - Ratings and methodologies posted on OASIS, or other protected, website.
- Normal & emergency ratings required for every hour for up to 10 days.
 - Updated every hour.
 - ***ISO-NE only will require ratings 2 days ahead.***

FERC Order 881 applicability

- Some exceptions to the order
 - Underground lines
 - Locations where limiting element is not dependent on temperature
 - Phase II may be an exception because not limited by ambient temperatures
 - Exceptions must be posted on OASIS



Possible VDU Impact:

- Currently ratings are only developed for PTF and PTF connected circuits (in ISO-NE) but may be required for other “transmission” (voltage undefined) facilities that restrict generation.