

OP-6 Appendix C

Charging of 345 kV Circuits in New England

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**Charging Of 345 kV Circuits In New England
(All MVAR values at nominal voltage)**

Circuit #	Terminals	Charging (MVAR)
301	Ludlow - Carpenter Hill	20.8
302	Carpenter Hill - Millbury No. 3	13.1
303	Berry Street - ANP Bellingham	6.2
307	Deerfield - Newington	21.5
308	Millbury No. 3 - Wachusett	11.0
310	Millstone - Manchester	41.8
312	Berkshire - Northfield Mountain	31.6
313	Millbury No. 3 - Wachusett	11.2
314	Wachusett - Sandy Pond	20.5
315	Brayton Point – West Farnum	33.6
316	Holbrook - Stoughton	5.2
319	Woburn - Lexington	7.5
321	Long Mountain - Plumtree	15.6
322	Canal - Carver	13.4
323	Millbury No. 3 - West Medway	13.4
324	Mystic - Kingston Street	87.5
325	West Medway - West Walpole	6.8
326	Sandy Pond - Lawrence Road - Scobie Pond	25.5
327	Brayton Point – Berry Street	21.0
328	West Farnum - Sherman Road	7.7
329	Frost Bridge - Southington	8.6
330	Card - Lake Road	25.8
331	Carver - West Walpole	22.3
332	West Farnum - Kent County	17.7
333	Ocean State - Sherman Road	.1
334	Ludlow - Stony Brook	4.4
335	Auburn Street - Holbrook	6.6
336	West Medway - NEA Bellingham - ANP	7.1

Circuit #	Terminals	Charging (MVAR)
	Blackstone	
337	Tewksbury - Sandy Pond	13.9
338	Tewksbury - Woburn	11.5
339	Wakefield Junction - Tewksbury	13.6
340	Vernon VT - Coolidge	43.7
342	Canal - Pilgrim - Auburn Street	41.8
343	Wachusett - Sandy Pond	19.7
344	Bridgewater - West Medway	25.3
346	North Cambridge - Woburn	120.4
347	Killingly - Sherman Road	12.9
348	Millstone - Haddam - Beseck	37.2
349	Wakefield Junction - Golden Hills	2.2
349X	Mystic - Golden Hills	120.0
349Y	Mystic - Golden Hills	120.0
350	Coolidge - West Rutland	23.6
351	Mystic - North Cambridge	91.4
352	Long Mountain - Frost Bridge	13.9
354	Ludlow - Northfield Mountain	25.2
355	Pilgrim - Carver	13.2
356	Bridgewater - Carver	12.9
357	Millbury - West Medway	13.5
358	Mystic - North Cambridge	91.4
361	Newington - Newington Energy	1.2
362	Haddam Neck - Beseck	16.1
363	Seabrook - Scobie Pond	26.6
364	Haddam Neck - Montville	19.5
365	North Cambridge - Woburn	120.4
367	Fitzwilliam - Amherst	20.5
368	Manchester - Card	13.6
369	Seabrook - Timber Swamp Road	4.4
370	West Rutland - New Haven	30.7

Circuit #	Terminals	Charging (MVAR)
371	Millstone - Montville	10.9
372	Mystic - Kingston Street	87.5
373	Scobie Pond - Deerfield	15.5
374	Buxton - Surowiec	21.9
375	Buxton - Maine Yankee	46.3
376	Haddam Neck - Scovill Rock	4.4
377	Surowiec - Maine Yankee	24.3
378	Mason - Maine Yankee	2.9
379	Vernon VT - Fitzwilliam	17.2
380	Amherst - Scobie Pond	13.2
381	Northfield Mountain – Vernon VT	16.9
383	Millstone - Card	24.9
384	Middletown - Scovill Rock	2.4
385	Deerfield - Buxton	40.6
386	Buxton - South Gorham	6.3
387	East Shore - Halvarsson -Scovill Rock	26.7
388	Maxcys - Orrington	44.9
389	West Medway - West Walpole	8.8
390	Orrington - Point Lepreau, NB	124.2
391	Buxton - Scobie Pond	56.1
392	Maine Yankee - Maxcys	21.1
393	Alps - Berkshire	20.0
394	Seabrook - West Amesbury - Ward Hill	25.8
395	Manchester - North Bloomfield - Barbour Hill	18.0
396	Orrington - Keene Road	42.7
397	Ward Hill - Tewksbury	13.7
398	Pleasant Valley - Long Mountain	15.3
3001	Keswick N.B. - Keene Road	81.6
3015	Keene Road - Chester SVC	0.1
3040	Yarmouth - South Gorham	20.1

Circuit #	Terminals	Charging (MVAR)
3041	Scovill Rock - Southington	16.7
3161	Stoughton – West. Walpole	8.3
3135	Newington - Timber Swamp Road	10.8
3162*	Stoughton - K Street	388.5/228.5
3163*	Stoughton - K Street	364.9/204.9
3164*	Stoughton - Hyde Park	248.6/88.6
3165*	Singer - East Devon	102.6/2.6
3280*	Singer – Norwalk	186.4/ 0.0
3320	Newfane – Vernon VT	15.1
3321	Newfane - Coolidge	30.4
3340	Vermont Yankee – Vernon VT	0.0
3348	Killingly - Lake Road	0.5
3361	ANP Blackstone - Sherman Road	12.1
3381	Vermont Yankee – Vernon VT	0.0
3403*	Plumtree - Norwalk (one cable in service)	269.1/119.1
3419	Barbour Hill - Ludlow	17.1
3424	Manchester - Kleen	11.4
3520	West Medway - ANP Bellingham	2.0
3533	Scovill Rock –Kleen	3.5
3619*	Singer - East Devon	102.6/2.6
3754	Beseck - Southington	10.4
3827	Beseck - East Devon	41.9
3921*	Singer - Norwalk	186.4/0.0

NOTE: A circuit ID followed by an asterisk (*) indicates a 345 kV cable that has one (1) or more reactors simultaneously switched upon cable energization; MVAR charging value listed indicates gross/net charging to account for reactor compensation. These are calculated values only and does not account for additional reactive resources available to further compensate cable charging.

OP 6 APPENDIX C REVISION HISTORY

Document History (This Document History documents action taken on the equivalent NEPOOL Procedure prior to the RTO Operations Date as well revisions made to the ISO New England Procedure subsequent to the RTO Operations Date.)

Rev. No.	Date	Reason
Rev 1	07/22/98	
Rev 2	09/01/2002	
Rev 3	06/11/2004	
Rev 4	11/09/2004	
Rev 5	02/01/05	Updated to conform to RTO terminology
Rev 6	08/23/06	Added 3162, 3164, 397, changed 394, 348
Rev 7	11/16/06	Added 3403, 3348 and revised nomenclature for 347
Rev 8	10/23/07	Revised line data resulting from the annual review process
Rev 9	08/11/08	Revise line data for new 345 kV circuits and from TOPs group and LCC reviews
Rev 10	10/20/09	Changed terminals for 355 line to Pilgrim – Carver & changed charging MVAR; Added 356 line Bridgewater – Carver & charging MVAR
Rev 11	12/15/09	Annual review by procedure owner; Circuit 339: replaced Golden Hills with Wakefield Junction & 15.8 MVAR with 13.6 MVAR Circuit 349: added terminals and MVAR; Circuit 353: deleted circuit and data; Circuit 367 added terminals and charging values; Circuit 379 Deleted “Amherst” inserted “Fitzwilliam, replaced 43.5 MVAR with 23.1 MVAR; Circuit 386: deleted “Yarmouth” replaced 25.3 MVAR with 6.27 MVAR; Circuit 393: replaced 25.8 MVAR with 20.0 MVAR; Circuit394: Inserted “- West Amesbury -” & replaced 23.1 MVAR with 25.8 MVAR; Circuit 3040: added terminals and charging MVAR; Circuit 3162*: added * for Note, added 2 nd charging MVAR; Circuit 3163*: added * for Note, added 2 nd charging MVAR; Circuit 3164*: added * for Note, added 2 nd charging MVAR; Circuit 3165*: Added terminals and charging value, added * for Note, added 2 nd charging MVAR; Circuit 3280*: Added terminals and charging value, added * for Note, added 2 nd charging MVAR; Circuit 3403*: Added * for Note, added 2 nd charging MVAR; Circuit 3424: Added terminals and charging MVAR; Circuit 3533: Added terminals and charging MVAR; Circuit 3619*: Added terminals and charging value, added * for Note, added 2 nd charging MVAR; Circuit 3921*: Added terminals and charging value, added * for Note, added 2 nd charging MVAR; Added ending Note: “A circuit ID followed by an asterisk(*) indicates a 345kV cable that has 1(one) or more reactors simultaneously switched upon cable energization; MVAR charging value listed indicates gross/net charging to account for reactor compensation. These are calculated values only and does not account for additional reactive resources available to further compensate cable charging.”
Rev 12	03/09/10	Annual review by procedure owner; Reformatted, replace text with a table including the text changed font to Arial; Added uncontrolled disclaimer to 1 st page footer & Uncontrolled to all pages; Added circuit 353 and data; Deleted circuit 3424 & data; Deleted circuit 3533 and data

Rev. No.	Date	Reason
Rev 13	05/24/10	Annual review by procedure owner; Modified Terminals and charging on 340,379 and 381, Added Terminals and charging for 3340 and 3381 as result of new Vernon VT substation; modified terminals and charging on 316 line, added terminals and charging on 3161 line; Resequenced lines to appear in numeric ascending order.
Rev 14	09/16/10	Deleted 353 line terminals and charging Added terminals and charging 3533 and 3424 lines Modified charging on 342 line
Rev 15	11/17/10	Modified charging and terminals on 396 line Added new item rows of data of terminals and charging MVARs for 345 kV Circuits 3001, 3015, 3320 and 3321
Rev 16	11/15/11	Modified 303 line information and terminals, added 327 line information and terminals for Berry St.