

Rapports au NPCC

1 Hydro-Québec TransÉnergie a l'obligation de transmettre annuellement à la Régie de
2 l'énergie, en vertu de la décision D-2002-175 et tel que réitéré dans la décision D-2009-015,
3 une copie des rapports publics qu'elle aura fournis au *Northeast Power Coordinating*
4 *Council* («*NPCC*») concernant les événements rapportables et la liste de ces événements
5 pour chacune des occasions où une indisponibilité rencontre les critères « d'événement
6 rapportable », soit une perte de charge de 300 MW et plus ou une perte de production de
7 500 MW et plus.

8 À cet égard, le Transporteur présente ci-après la liste des événements rapportables au
9 NPCC et des rapports afférents qu'il lui a transmis en 2011.

Liste des rapports ATR (Area Trouble Report) fournis par TransÉnergie au NPCC en 2011

Temps			MW perdus		Perturbations	T récupération		Fréquence	C-11	% Récup.		Cause	Caté- gories
Mois	Jour	Heure	Produc- tion	Charge/ Livraison	installation et équipement	ACE (T-4)	ACE=0	extrême	% charge/ 0,1 Hz	% APC <1000 (code 1)	% APC >=1000 (code 2)		
Janvier		aucun											
Février	27	10:04:39	990		Décl. A8, A9 à la centrale Churchill Falls; perte de production de 990 MW.	03:03	03:08	59,46 Hz	2,82%	100%	-	Décl. du transformateur T75 par protection différentielle.	3
	28	06:42:00	502		Décl. A6 à la centrale Churchill Falls; perte de production de 502 MW.	s/o	03:31	59,73 Hz	3,05%	100%	-	Problème de refroidissement de l'excitation.	3
Mars		aucun											
Avril	11	21:20:30	850		Décl. L7008 et L7023; rejet de production A2, A4 à la centrale Churchill Falls.	01:28	01:42	59,62 Hz	3,14%	100%	-	Explosion du D700-07 phase C à l'ouverture pour contrôle de tension et bris de D700-51 phase B par projection de débris.	3
	27	08:38:48	656		Décl. L7067 centrale La Grande-3 / Chissibi et L7057 Chissibi / Lemoyne; perte (îlotage) de production A5, A6, A7, A8 à la centrale La Grande-3.	03:06	03:04	59,57 Hz	2,32%	100%	-	Explosion (feu) phase B du TC du D700-15 au poste Chissibi.	3
Mai	29	19:11:24	748		Décl. 7072 Tilly / centrale La Grande-4; perte de production A4, A5, A6 à la centrale La Grande-4.	s/o	01:54	59,36 Hz	1,86%	-	100%	Par protection de secours du groupe A6 (bas niveau d'huile palier de butée).	3
Juin	6	03:28:53	594		Mise hors tension de la L7062 au poste Radisson; rejet de production A7, A10 à la centrale LG2.	s/o	05:08	59,39 Hz	1,69%	-	100%	1. Carte de télécommunications défectueuse 2. Erreur du répartiteur CCR a autorisé la mht de L7062 avant de forcer un zéro sur la consigne RPTC de L7062 dans Spectrum.	3 et 2
	7	15:37:12	605		Décl. T2 au poste La Grande-2 par protection de haute température; perte de production A3, A4 à la centrale La Grande-2.	02:12	02:10	59,54 Hz	4,84%	100%	-	Déclenchement intempestif. Mauvaise indication de température due à une résistance surchauffée, qui donne une image thermique du transformateur.	3
	10	01:31:15	680		Arrêt forcé GC1, GC2 au poste Outaouais; décl. du GC1 pendant la procédure d'arrêt; perte d'import de EISO.	01:22	01:24	59,70 Hz	8,06%	-	100%	Problème aux Filtres F2 et F4.	3
	11	12:02:39	600		Décl. T2 au poste La Grande-G2 par protection de haute température; perte de production A3, A4 à la centrale La Grande-2.	01:47	01:54	59,55 Hz	2,68%	100%	-	Déclenchement intempestif. Mauvaise indication de température due à une résistance surchauffée, qui donne une image thermique du transformateur.	3

Liste des rapports ATR (Area Trouble Report) fournis par TransÉnergie au NPCC en 2011

Temps			MW perdus		Perturbations	T récupération		Fréquence	C-11	% Récup.		Cause	Caté- gories
Mois	Jour	Heure	Production	Charge/ Livraison	installation et équipement	ACE (T-4)	ACE=0	extrême	% charge/ 0,1 Hz	% APC <1000 (code 1)	% APC >=1000 (code 2)		
	15	19:58:19	620		Décl. de la centrale Chute-des-Passes (réseau voisin Rio Tinto Alcan).	01:24	01:27	59,53 Hz	2,71%	100%	-	Cause pas indiquée.	RV
	20	14:02:58	600		Décl. L3162 au poste Radisson; perte de production A21, A22 à la centrale La Grande-2A.	s/o	01:15	59,58 Hz	3,58%	100%	-	Défaut à l'intérieur du D300-22 (défaut de type A-N); décl. B1 et T22, envoi d'un signal au poste Radisson pour déclencher L3162.	3
	27	09:47:24	780		Ouverture du D700-17 au poste Manicouagan; rejet de production A4, A6 à la centrale Churchill Falls.	01:53	01:56	59,41 Hz	2,68%	100%	-	Erreur humaine.	2
	29	14:20:36	531		Décl. L3168 et L3169 Nikamo / Laforge-2; perte de production aux centrales Laforge-1 (A11, A13), Laforge-2 (A22) et Brisay (A1).	s/o	01:43	59,66 Hz	2,61%	100%	-	Orage	1
Juillet	1	09:35:51	775		Décl. de la L7028 au poste Manic; rejet de production A4, A6 à la centrale Churchill Falls.	02:52	03:11	59,35 Hz	2,92%	100%	-	Au poste Manic, lors de manoeuvres visant à isoler le D700-56, une phase du D700-56 est restée fermée; une phase de l'inductance XL6 a été mise hors tension par l'ouverture du S56B22, qui a été endommagé.	2
	17	10:37:21	572		Décl. du T3 à la centrale La Grande-2; perte de production A5, A6.	s/o	01:27	59,59 Hz	2,26%	100%	-	Basse pression au réservoir oléopneumatique du groupe A6.	3
	28	22:23:34	697		Décl. L3176, 3177 Nemiscau / Eastmain-1 et 3190 Nemiscau / Eastmain-1-A; perte des centrales Eastmain-1 (484 MW) et Eastmain-1-A (233 MW).	s/o	02:39	59,51 Hz	2,63%	100%	-	Orage	1
Août	1	11:40:33	652		Décl. des groupes A1 et A2 à la centrale SM3 à 11h40min30s et 11h41min15s.	02:02	02:09	59,75 Hz	5,48%	100%	-	Défaut sur l'onduleur de l'ASSC et panne de l'alimentation 120 kV c.a.	3
	1	14:30:54	585		Décl. des lignes L61+62 sur le réseau voisin Rio Tinto Alcan; perte de production à la centrale Chute-des-Passes.	01:20	01:25	59,58 Hz	3,95%	100%	-	Foudre	1
	18	15:40:42	514		Décl. L3176 au poste Eastmain-1; perte de production aux centrales Eastmain-1 (A2, A3) et Eastmain-1-A (A11).	s/o	01:21	59,64 Hz	1,52%	100%	-	Foudre près du pylône #35.	1

Report No. ATR_HQTE_2011_02_27_11_CHURCHILL FALLS_990 Date: 02-27-11 Time: 10:04:39
QUÉBEC

Origin: Generation loss at Churchill Falls GS (units 8 and 9).

Cause: Tripping of a 735-kV Transformer (T75) by differential protection.

Generation Loss: 990 MW Percent of Loss to First Contingency: 98 %
 Load Loss: _____ MW Maximum Interchange Deviation: 169 MW

Time to return ACE to initial (T-4) value: 03:03 minutes
 Time to return ACE to zero: 03:08 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) Y
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) Freq. (after) Freq. Dev.
59,9893 60,0090 0,0197

Comments: _____

See Comment File: _____

See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8713	2999	3024	-707
T-56 sec					T+36 sec	59,8690	2999	3005	-756
T-52 sec	60,0227	2999	3100	94	T+40 sec	59,8757	2999	3016	-744
T-48 sec	60,0200	2999	3097	149	T+44 sec	59,8807	2999	3022	-696
T-44 sec	60,0107	2999	3093	102	T+48 sec	59,8760	2999	3013	-699
T-40 sec	60,0080	2999	3094	56	T+52 sec	59,8840	2999	3021	-707
T-36 sec	60,0100	2999	3090	47	T+56 sec	59,8970	2999	3017	-648
T-32 sec	60,0140	2999	3085	68	T+60 sec	59,8970	2999	3020	-620
T-28 sec	60,0087	2999	3083	83	T+2 min	59,9360	2999	3042	-419
T-24 sec	59,9970	2999	3079	35	T+3 min	59,9920	2999	3075	-38
T-20 sec	59,9863	2999	3074	-37	T+4 min	60,0410	2999	3093	254
T-16 sec	59,9870	2999	3070	-85	T+5 min	60,0080	2999	3065	59
T-12 sec	59,9900	2999	3068	-70	T+6 min	60,0040	2999	3047	2
T-08 sec	59,9907	2999	3069	-56	T+7 min	60,0370	2999	3079	249
T-04 sec	59,9893	2999	3064	-57	T+8 min	60,0250	2999	3053	146
T=0 sec	59,8990	2999	3011	-61	T+9 min	60,0060	2999	3058	-38
T+04 sec	59,4177	2999	2895	-749	T+10 min	60,0070	2999	3066	31
T+08 sec	59,3630	2999	2963	-4000	T+11 min	60,0230	2999	3057	153
T+12 sec	59,6740	2999	2965	-2593	T+12 min	60,0260	2999	3051	182
T+16 sec	59,7833	2999	2960	-1609	T+13 min	60,0010	2999	3039	10
T+20 sec	59,8327	2999	2978	-1076	T+14 min	60,0040	2999	3045	6
T+24 sec	59,8560	2999	2979	-946	T+15 min	60,0050	2999	3051	17
T+28 sec	59,8720	2999	2980	-779					

Report No. ATR_HQTE_2011_02_28_07_CHURCHILL FALLS_502 MW Date 02-28-11 Time: 06:42:00
QUÉBEC

Origin: Generation loss at Churchill Falls GS (unit 6).

Cause: Problem with the cooling system of the exciter.

Generation Loss: 502 MW Percent of Loss to First Contingency: 50 %
 Load Loss: _____ MW Maximum Interchange Deviation: 63 MW

Time to return ACE to initial (T-4) value: _____ minutes
 Time to return ACE to zero: 03:31 minutes

Freq. (@T-4) 60,0150 Freq. (after) 60,0075 Freq. Dev. -0,0075
 Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Comments: _____

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,9620	2953	3001	-224
T-56 sec					T+36 sec	59,9610	2953	3004	-237
T-52 sec	60,0177	2953	3030	115	T+40 sec	59,9757	2953	3006	-226
T-48 sec	60,0180	2953	3030	102	T+44 sec	59,9920	2953	3028	-122
T-44 sec	60,0217	2953	3033	114	T+48 sec	59,9920	2953	3022	-54
T-40 sec	60,0257	2953	3034	132	T+52 sec	59,9893	2953	3021	-44
T-36 sec	60,0290	2953	3035	161	T+56 sec	59,9833	2953	3031	-69
T-32 sec	60,0273	2953	3036	172	T+60 sec	60,0020	2953	3024	-80
T-28 sec	60,0207	2953	3037	153	T+2 min	59,9910	2953	3026	-14
T-24 sec	60,0150	2953	3041	112	T+3 min	59,9990	2953	3015	-37
T-20 sec	60,0110	2953	3041	80	T+4 min	60,0060	2953	3020	41
T-16 sec	60,0103	2953	3036	64	T+5 min	60,0210	2953	3030	107
T-12 sec	60,0100	2953	3039	61	T+6 min	60,0010	2953	3029	8
T-08 sec	60,0103	2953	3033	60	T+7 min	59,9900	2953	3025	-30
T-04 sec	60,0150	2953	3028	64	T+8 min	60,0260	2953	3052	145
T=0 sec	59,9160	2953	2998	97	T+9 min	60,0360	2953	3043	242
T+04 sec	59,7147	2953	2965	-684	T+10 min	59,9920	2953	3027	-32
T+08 sec	59,7367	2953	2987	-1949	T+11 min	60,0000	2953	3028	-18
T+12 sec	59,8530	2953	2974	-1144	T+12 min	60,0110	2953	3022	65
T+16 sec	59,8997	2953	2973	-759	T+13 min	60,0070	2953	3022	38
T+20 sec	59,9247	2953	2985	-513	T+14 min	60,0090	2953	3015	81
T+24 sec	59,9370	2953	2993	-452	T+15 min	60,0030	2953	3009	10
T+28 sec	59,9570	2953	2999	-338					

Report No. ATR_HQTE_2011_04_11_22_MANICOUAGAN_850 MW Date: 04-11-11 Time: 21:20:30
QUÉBEC

Origin: Generation rejection at Churchill Falls GS (units 2 and 4).

Cause: Tripping of a 735-kV Line 7008 Manicouagan to Levis Substations caused by an explosion in
 Circuit breaker 700-7 phase C at Manicouagan Substation. Tripping of Line 7023 caused by
 ejected fragments on circuit breaker 700-51 phase B.

Generation Loss: 850 MW Percent of Loss to First Contingency: 86 %
 Load Loss: _____ MW Maximum Interchange Deviation: 54 MW

Time to return ACE to initial (T-4) value: 01:28 minutes
 Time to return ACE to zero: 01:42 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) Y
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 60,0157 Freq. (after) 59,9948 Freq. Dev. -0,0209

Comments: The explosion on Circuit breaker 700-7 was caused by electrical arcing in the support column of
 module 4 of phase C. The failure of air isolation was caused by moisture infiltration through a leaky
 opening pilot valve. It had been raining all day and relative humidity was 100%. Ejected fragments
 caused the fault on Circuit breaker 700-51 and the tripping of Line 7023. Load rejection of 12 MW
 at Jeanne-d'Arc substation (restored in 10 minutes) should not have operated - under investigation.

See Comment File: _____

See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE
T-60 sec				
T-56 sec				
T-52 sec	59,9817	3921	3932	-66
T-48 sec	59,9880	3921	3936	-86
T-44 sec	59,9913	3921	3943	-47
T-40 sec	59,9833	3921	3941	-49
T-36 sec	59,9830	3921	3946	-86
T-32 sec	59,9880	3921	3942	-76
T-28 sec	59,9960	3921	3946	-46
T-24 sec	59,9990	3921	3945	-9
T-20 sec	60,0007	3921	3937	-3
T-16 sec	59,9980	3921	3940	7
T-12 sec	59,9920	3921	3941	-20
T-08 sec	59,9897	3921	3936	-39
T-04 sec	60,0157	3921	3934	-56
T=0 sec	60,0220	3921	3904	136
T+04 sec	59,6273	3921	3904	86
T+08 sec	59,5160	3921	3880	-2109
T+12 sec	59,8100	3921	3902	-1349
T+16 sec	59,8887	3921	3894	-684
T+20 sec	59,9007	3921	3913	-411
T+24 sec	59,8880	3921	3910	-480
T+28 sec	59,8800	3921	3906	-509

Time	F	Sched	Actual	ACE
T+32 sec	59,8753	3921	3908	-542
T+36 sec	59,8790	3921	3903	-546
T+40 sec	59,8843	3921	3904	-540
T+44 sec	59,9030	3921	3914	-514
T+48 sec	59,9340	3921	3917	-385
T+52 sec	59,9593	3921	3922	-267
T+56 sec	59,9697	3921	3910	-155
T+60 sec	59,9460	3921	3912	-164
T+2 min	60,0040	3921	3940	72
T+3 min	60,0400	3921	3955	234
T+4 min	60,0150	3921	3940	54
T+5 min	60,0020	3921	3945	24
T+6 min	59,9880	3921	3938	-15
T+7 min	60,0120	3921	3943	94
T+8 min	60,0160	3921	3938	82
T+9 min	59,9930	3921	3938	4
T+10 min	59,9600	3921	3938	-167
T+11 min	59,9890	3921	3929	-123
T+12 min	59,9570	3921	3932	-187
T+13 min	59,9590	3921	3918	-247
T+14 min	60,0510	3921	3941,335	228
T+15 min	60,0120	3607	3950,568	75

Origin: Generation loss at La Grande-3 GS (unit 5, 6, 7 ans 8).

Cause: Tripping of two 735-kV Lines (7067 La Grande-3 to Chissibi and 7057 Chissibi to Lemoyne) due to an explosion in current transformer CT15B18 (Circuit breaker 700-15) on phase B, at Chissibi Substation.

Generation Loss: 656 MW Percent of Loss to First Contingency: 66 %
 Load Loss: _____ MW Maximum Interchange Deviation: 60 MW

Time to return ACE to initial (T-4) value: 03:06 minutes
 Time to return ACE to zero: 03:04 minutes

Freq. (@T-4) 59,9947 Freq. (after) 60,0308 Freq. Dev. 0,0361
 Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Comments: The cause of the explosion is still in investigation. It will be difficult to determine, given the state of the equipment. Units tripped by over-speed protection.

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8780	3799	3758	-533
T-56 sec					T+36 sec	59,8850	3799	3772	-574
T-52 sec	60,0023	3799	3797	-4	T+40 sec	59,8917	3799	3767	-544
T-48 sec	60,0070	3799	3794	13	T+44 sec	59,9067	3799	3770	-511
T-44 sec	60,0083	3799	3790	37	T+48 sec	59,9190	3799	3775	-433
T-40 sec	60,0063	3799	3801	39	T+52 sec	59,9230	3799	3763	-372
T-36 sec	60,0040	3799	3796	29	T+56 sec	59,9203	3799	3772	-360
T-32 sec	60,0003	3799	3798	13	T+60 sec	59,9200	3799	3772	-374
T-28 sec	59,9963	3799	3804	-3	T+2 min	59,9570	3799	3779	-257
T-24 sec	59,9960	3799	3800	-22	T+3 min	59,9840	3799	3793	-8
T-20 sec	59,9970	3799	3805	-18	T+4 min	60,0140	3799	3796	124
T-16 sec	59,9983	3799	3805	-15	T+5 min	60,0010	3799	3783	8
T-12 sec	59,9990	3799	3801	-3	T+6 min	59,9840	3799	3758	-51
T-08 sec	59,9953	3799	3804	-10	T+7 min	60,0080	3799	3761	73
T-04 sec	59,9947	3799	3783	-26	T+8 min	59,9850	3799	3756	-97
T=0 sec	59,8990	3799	3723	-25	T+9 min	59,9940	3799	3749	-17
T+04 sec	59,5483	3799	3748	-638	T+10 min	59,9860	3799	3751	-82
T+08 sec	59,5277	3799	3763	-2582	T+11 min	60,0130	3799	3760	-29
T+12 sec	59,7610	3799	3757	-1669	T+12 min	60,0360	3799	3772	150
T+16 sec	59,8503	3799	3760	-970	T+13 min	60,0460	3799	3783	214
T+20 sec	59,8897	3799	3767	-612	T+14 min	60,0140	3799	3772	92
T+24 sec	59,8860	3799	3760	-574	T+15 min	60,0270	3799	3783	118
T+28 sec	59,8887	3799	3766	-538					

Report No. ATR_HQTE_2011_05_29_20_TILLY_748 MW Date: 05-29-11 Time: 19:11:24
QUÉBEC

Origin: Generation loss at La Grande-4 GS (units 4, 5 and 6).

Cause: Tripping of 735-kV Line 7072 Tilly Substation to La Grande-4 GS by back-up protection of unit 6 at La Grande-4 GS (low level of oil on the thrust bearing).

Generation Loss: 748 MW Percent of Loss to First Contingency: 100 %
 Load Loss: _____ MW Maximum Interchange Deviation: 213 MW

Time to return ACE to initial (T-4) value: _____ minutes
 Time to return ACE to zero: 01:54 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) Y
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 60,0130 Freq. (after) 60,0118 Freq. Dev. -0,0012

Comments: _____

See Comment File: _____

See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8073	2392	2377	-786
T-56 sec					T+36 sec	59,8160	2392	2373	-659
T-52 sec	60,0130	2392	2390	50	T+40 sec	59,8040	2392	2354	-631
T-48 sec	60,0070	2392	2384	47	T+44 sec	59,7887	2392	2365	-692
T-44 sec	59,9980	2392	2384	14	T+48 sec	59,8130	2392	2372	-706
T-40 sec	60,0053	2392	2384	-8	T+52 sec	59,8437	2392	2381	-631
T-36 sec	60,0210	2392	2389	33	T+56 sec	59,8860	2392	2380	-513
T-32 sec	60,0227	2392	2383	79	T+60 sec	59,8900	2392	2383	-466
T-28 sec	60,0187	2392	2386	78	T+2 min	60,0110	2392	2401	50
T-24 sec	60,0160	2392	2384	64	T+3 min	60,0470	2392	2409	233
T-20 sec	60,0103	2392	2384	54	T+4 min	60,0250	2392	2395	32
T-16 sec	60,0070	2392	2383	32	T+5 min	59,9920	2392	2390	-14
T-12 sec	60,0120	2392	2385	24	T+6 min	59,9990	2392	2393	12
T-08 sec	60,0143	2392	2382	45	T+7 min	60,0640	2392	2403	188
T-04 sec	60,0130	2392	2386	52	T+8 min	60,0710	2392	2414	227
T=0 sec	59,8860	2392	2351	42	T+9 min	60,0420	2392	2406	199
T+04 sec	59,3767	2392	2335	-539	T+10 min	60,0150	2392	2393	47
T+08 sec	59,2957	2392	2173	-2601	T+11 min	60,0210	2392	2392	43
T+12 sec	59,5180	2392	2339	-1927	T+12 min	60,0040	2392	2396	8
T+16 sec	59,5953	2392	2353	-1584	T+13 min	60,0390	2392	2394	147
T+20 sec	59,6843	2392	2367	-1338	T+14 min	59,9970	2392	2398	19
T+24 sec	59,7250	2392	2366	-1068	T+15 min	60,0070	2392	2387	30
T+28 sec	59,7637	2392	2363	-915					

Report No. ATR_HQT_2011_06_06_04_7062_594 MW Date: 06-06-11 Time: 03:28:53
QUÉBEC

Origin: Generation rejection at La Grande-2 GS (units 7 and 10).
 Cause: 1. A faulty telecommunications card caused the tripping of 735-kV Line 7062 (under investigation).
There were many alarms related to protection systems. 2. The CCR Dispatcher requested Line 7062 to be put off-potential, before forcing to zero the set points for RPTC SPS on Line 7062.
3. The card should have given a communication alarm instead of giving tripping tones.

Generation Loss: 594 MW Percent of Loss to First Contingency: 115 %
 Load Loss: _____ MW Maximum Interchange Deviation: 128 MW

Time to return ACE to initial (T-4) value: _____ minutes
 Time to return ACE to zero: 05:08 minutes Runback? (Y/N) N

Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 60,0113 Freq. (after) 60,0063 Freq. Dev. -0,0051

Comments: Telecommunications final report should be available in a few weeks. RPTC SPS operated correctly, given the set point for the number of units to reject which was in effect at that moment.
Reference: EA Process 20110606_0328_HQT_Radisson L7062

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,7900	-328	-434	-560
T-56 sec					T+36 sec	59,7920	-328	-412	-482
T-52 sec	60,0340	-328	-390	84	T+40 sec	59,7760	-328	-406	-468
T-48 sec	60,0210	-328	-386	82	T+44 sec	59,7617	-328	-403	-516
T-44 sec	59,9957	-328	-388	35	T+48 sec	59,7780	-328	-407	-513
T-40 sec	59,9803	-328	-388	-25	T+52 sec	59,7847	-328	-400	-500
T-36 sec	59,9890	-328	-392	-52	T+56 sec	59,8247	-328	-396	-486
T-32 sec	60,0083	-328	-395	-14	T+60 sec	59,8410	-328	-395	-435
T-28 sec	60,0123	-328	-394	28	T+2 min	59,8880	-328	-379	-288
T-24 sec	59,9990	-328	-396	27	T+3 min	59,9780	-328	-372	-58
T-20 sec	60,0010	-328	-390	-3	T+4 min	59,9850	-328	-377	-27
T-16 sec	60,0083	-328	-390	9	T+5 min	59,9670	-328	-365	-69
T-12 sec	60,0100	-328	-387	22	T+6 min	60,1280	-328	-352	362
T-08 sec	60,0113	-328	-388	26	T+7 min	60,0570	-328	-344	176
T-04 sec	60,0113	-328	-391	27	T+8 min	60,0410	-328	-364	140
T=0 sec	60,0120	-328	-419	30	T+9 min	60,0280	-328	-370	73
T+04 sec	59,7453	-328	-446	25	T+10 min	59,9910	-328	-366	-43
T+08 sec	59,2920	-328	-519	-727	T+11 min	59,9790	-328	-388	-39
T+12 sec	59,4180	-328	-431	-1460	T+12 min	59,9920	-328	-387	-13
T+16 sec	59,5193	-328	-438	-1273	T+13 min	60,0040	-328	-315	-10
T+20 sec	59,6107	-328	-418	-1031	T+14 min	60,0140	-328	-373	25
T+24 sec	59,6720	-328	-419	-861	T+15 min	60,0150	-328	-373	28
T+28 sec	59,7360	-328	-428	-706					

Report No. ATR_HQT_2011_06_07_16_La Grande-2_605 MW Date: 06-07-11 Time: 15:37:12
QUÉBEC

Origin: Generation loss at La Grande-2 GS (units 3 and 4).

Cause: Tripping of 735/12-kV Power Transformer 2 at La Grande-2 Substation by the high temperature protection on phase A. Incorrect temperature indication. The probe check OK. When trying to reenergize the power transformer the personnel found a broken contact on the relay 49D and fixed it. But this was not the problem.

Generation Loss: 605 MW Percent of Loss to First Contingency: 57 %
 Load Loss: _____ MW Maximum Interchange Deviation: 127 MW

Time to return ACE to initial (T-4) value: 02:12 minutes
 Time to return ACE to zero: 02:10 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 59,9537 Freq. (after) 60,0225 Freq. Dev. 0,0688

Comments: There was a second tripping on June 11th.
Reference: EA Process 20110607_1537_HQT_La Grande-2_T2

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,9073	5130	5010	-407
T-56 sec					T+36 sec	59,8900	5130	5013	-423
T-52 sec	60,0000	5130	4991	-30	T+40 sec	59,8833	5130	5020	-481
T-48 sec	60,0040	5130	4988	7	T+44 sec	59,8900	5130	5018	-500
T-44 sec	60,0087	5130	4988	20	T+48 sec	59,9060	5130	5022	-450
T-40 sec	60,0160	5130	4986	46	T+52 sec	59,9127	5130	5027	-380
T-36 sec	60,0230	5130	4987	80	T+56 sec	59,9093	5130	5027	-365
T-32 sec	60,0227	5130	4985	97	T+60 sec	59,9250	5130	5038	-382
T-28 sec	60,0233	5130	4986	106	T+2 min	60,0020	5130	5054	-34
T-24 sec	60,0190	5130	4985	95	T+3 min	60,0370	5130	5069	169
T-20 sec	60,0220	5130	4993	88	T+4 min	59,9950	5130	5077	25
T-16 sec	60,0240	5130	4992	97	T+5 min	60,0070	5130	5050	23
T-12 sec	60,0280	5130	4986	111	T+6 min	60,0140	5130	5055	78
T-08 sec	59,9890	5130	5021	80	T+7 min	60,0110	5130	5051	79
T-04 sec	59,9537	5130	5021	-98	T+8 min	60,0000	5130	5063	-12
T=0 sec	59,9450	5130	4994	-232	T+9 min	60,0480	5130	5072	221
T+04 sec	59,8183	5130	4895	-235	T+10 min	60,0340	5130	5054	162
T+08 sec	59,4400	5130	4947	-899	T+11 min	60,0330	5130	5050	137
T+12 sec	59,6270	5130	4972	-1861	T+12 min	60,0300	5130	5057	110
T+16 sec	59,7297	5130	5006	-1486	T+13 min	60,0290	5130	5052	89
T+20 sec	59,8157	5130	5002	-1034	T+14 min	60,0390	5130	5051	160
T+24 sec	59,8670	5130	4994	-743	T+15 min	59,9920	5130	5035	-1
T+28 sec	59,8963	5130	4995	-505					

Report No. ATR_HQT_2011_06_10_02_OUTAOUAIS_680 MW Date: 06-10-11 Time: 01:31:15
QUÉBEC

Origin: Loss of import from IESO neighboring system.

Cause: Forced shutdown of converter units 1 and 2 at Outaouais Substation. Fire in the coils of filters 2 and 4. Unit 1 tripped during the shutdown procedure.

Generation Loss: 680 MW Percent of Loss to First Contingency: 105 %
 Load Loss: _____ MW Maximum Interchange Deviation: 358 MW

Time to return ACE to initial (T-4) value: 01:22 minutes
 Time to return ACE to zero: 01:24 minutes

Freq. (@T-4) Freq. (after) Freq. Dev.
59,9630 60,0238 0,0607

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Comments: _____

See Comment File: _____

See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec	59,9850		1655	-69	T+32 sec	59,9460	2012	2060	-202
T-56 sec					T+36 sec	59,9480	2012	2060	-162
T-52 sec	59,9893	2012	1668	-35	T+40 sec	59,9587	2012	2072	-149
T-48 sec	59,9930	2012	1675	-28	T+44 sec	59,9593	2012	2066	-116
T-44 sec	59,9973	2012	1684	-17	T+48 sec	59,9650	2012	2072	-118
T-40 sec	59,9960	2012	1682	-8	T+52 sec	59,9783	2012	2077	-100
T-36 sec	59,9850	2012	1690	-15	T+56 sec	60,0000	2012	2079	-53
T-32 sec	59,9737	2012	1698	-51	T+60 sec	60,0000	2012	2075	-28
T-28 sec	59,9603	2012	1700	-90	T+2 min	60,0090	2012	2050	42
T-24 sec	59,9580	2012	1702	-123	T+3 min	60,0190	2012	2006	54
T-20 sec	59,9657	2012	1704	-117	T+4 min	59,9940	2012	1914	-13
T-16 sec	59,9697	2012	1703	-97	T+5 min	60,0190	2012	1909	80
T-12 sec	59,9690	2012	1720	-87	T+6 min	59,9940	2012	1912	-6
T-08 sec	59,9603	2012	1722	-98	T+7 min	60,0020	2012	1912	42
T-04 sec	59,9630	2012	1721	-122	T+8 min	59,9890	2012	1908	-13
T=0 sec	59,8390	2012	2048	-99	T+9 min	59,9930	2012	1911	-13
T+04 sec	59,6710	2012	2034	-600	T+10 min	60,0000	2012	1909	-5
T+08 sec	59,7247	2012	2020	-1095	T+11 min	59,9970	2012	1882	-29
T+12 sec	59,8290	2012	2027	-659	T+12 min	60,0100	2012	1900	3
T+16 sec	59,8770	2012	2036	-454	T+13 min	60,0250	2012	1908	42
T+20 sec	59,8850	2012	2036	-328	T+14 min	59,9990	2012	1903	9
T+24 sec	59,9060	2012	2048	-325	T+15 min	59,9980	2012	1901	9
T+28 sec	59,9260	-2423	-2632	-260					

Report No. ATR_HQT_2011_06_11_13_La Grande-2_600 MW Date: 06-11-11 Time: 12:02:39
QUÉBEC

Origin: Generation loss at La Grande-2 GS (units 3 and 4).

Cause: Tripping of 735/12-kV Power Transformer 2 at La Grande-2 Substation by high temperature protection on phase A. Second tripping cause by an incorrect temperature indication. After further investigation, an overheating resistor was found in the protection system and replaced.

Generation Loss: 600 MW Percent of Loss to First Contingency: 56 %
 Load Loss: _____ MW Maximum Interchange Deviation: 142 MW

Time to return ACE to initial (T-4) value: 01:47 minutes
 Time to return ACE to zero: 01:54 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 59,9827 Freq. (after) 59,9880 Freq. Dev. 0,0053

Comments: Reference: EA Process 20110611_1202_HQT_La Grande-2_T2

See Comment File: _____

See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8513	3111	3073	-447
T-56 sec					T+36 sec	59,8590	3111	3088	-570
T-52 sec	60,0003	3111	3125	56	T+40 sec	59,8817	3111	3085	-505
T-48 sec	59,9830	3111	3125	-21	T+44 sec	59,8860	3111	3085	-415
T-44 sec	59,9897	3111	3125	-59	T+48 sec	59,8770	3111	3094	-445
T-40 sec	59,9983	3111	3128	-29	T+52 sec	59,8743	3111	3100	-457
T-36 sec	59,9980	3111	3123	1	T+56 sec	59,8817	3111	3096	-468
T-32 sec	59,9930	3111	3127	-17	T+60 sec	59,8850	3111	3094	-447
T-28 sec	60,0010	3111	3129	-23	T+2 min	60,0360	3111	3142	53
T-24 sec	60,0050	3111	3129	17	T+3 min	60,0310	3111	3152	84
T-20 sec	59,9927	3111	3129	9	T+4 min	60,0160	3111	3141	129
T-16 sec	59,9873	3111	3133	-42	T+5 min	60,0490	3111	3142	142
T-12 sec	59,9930	3111	3125	-45	T+6 min	60,0530	3111	3156	159
T-08 sec	59,9880	3111	3125	-32	T+7 min	60,0110	3111	3150	24
T-04 sec	59,9827	3111	3128	-53	T+8 min	60,0510	3111	3158	256
T=0 sec	59,9780	3111	3091	-68	T+9 min	60,0000	3111	3139	9
T+04 sec	59,6980	3111	2986	-86	T+10 min	60,0100	3111	3144	86
T+08 sec	59,4313	3111	3072	-1376	T+11 min	60,0180	3111	3136	55
T+12 sec	59,6840	3111	3040	-1516	T+12 min	60,0080	3111	3127	28
T+16 sec	59,7893	3111	3048	-1051	T+13 min	59,9950	3111	3132	-8
T+20 sec	59,8447	3111	3057	-682	T+14 min	60,0010	3111	3133	-1
T+24 sec	59,8640	3111	3067	-595	T+15 min	60,0050	3111	3136	51
T+28 sec	59,8760	-2423	-2632	-472					

Report No. ATR_HQT_2011_06_15_20_RTA_620 MW Date: 06-15-11 Time: 19:58:19
QUÉBEC

Origin: Generation loss from Chute-des-Passes GS (Rio Tinto Alcan).

Cause: Tripping of the generating station.

Generation Loss: 620 MW Percent of Loss to First Contingency: 61 %
 Load Loss: _____ MW Maximum Interchange Deviation: 666 MW

Time to return ACE to initial (T-4) value: 01:24 minutes
 Time to return ACE to zero: 01:27 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 60,0087 Freq. (after) 60,0110 Freq. Dev. 0,0023

Comments: _____

See Comment File: _____

See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8877	3035	3738	-418
T-56 sec					T+36 sec	59,8860	3035	3754	-483
T-52 sec	59,9680	3035	3111	-93	T+40 sec	59,9060	3035	3759	-485
T-48 sec	59,9670	3035	3103	-150	T+44 sec	59,9410	3035	3757	-380
T-44 sec	59,9787	3035	3108	-124	T+48 sec	59,9550	3035	3768	-228
T-40 sec	59,9840	3035	3109	-87	T+52 sec	59,9750	3035	3769	-179
T-36 sec	59,9970	3035	3105	-58	T+56 sec	59,9850	3035	3773	-85
T-32 sec	60,0087	3035	3106	2	T+60 sec	59,9770	3035	3771	-91
T-28 sec	60,0107	3035	3108	40	T+2 min	60,0370	3083	3810	109
T-24 sec	60,0090	3035	3106	45	T+3 min	60,0340	3083	3835	103
T-20 sec	60,0040	3035	3103	33	T+4 min	60,0020	3083	3821	42
T-16 sec	59,9980	3035	3102	8	T+5 min	60,0070	3083	3819	41
T-12 sec	59,9940	3035	3100	-11	T+6 min	60,0040	3083	3806	-4
T-08 sec	59,9947	3035	3105	-28	T+7 min	60,0010	3083	3797	17
T-04 sec	60,0087	3035	3107	-11	T+8 min	60,0110	3083	3777	28
T=0 sec	60,0230	3035	3068	54	T+9 min	60,0120	3083	3783	45
T+04 sec	59,7257	3035	3034	112	T+10 min	59,9880	3083	3779	-54
T+08 sec	59,3900	3035	3586	-1480	T+11 min	59,9940	3083	3789	-13
T+12 sec	59,7070	3035	3729	-1805	T+12 min	60,0000	3083	3788	21
T+16 sec	59,8537	3035	3734	-1055	T+13 min	60,0320	3083	3802	207
T+20 sec	59,9437	3035	3743	-464	T+14 min	60,0220	3083	3792	71
T+24 sec	59,9250	3035	3739	-311	T+15 min	59,9900	3083	3796	-51
T+28 sec	59,9063	3035	3748	-319					

Report No. ATR_HQT_2011_06_20_15_RADISSON_600 MW Date: 06-20-11 Time: 14:02:58
QUÉBEC

Origin: Generation loss at La Grande-2A GS (units 21 and 22).

Cause: Tripping of 315-kV Line 3162 at Radisson substation caused by a fault in the 315-kV Circuit Breaker 300-22.

Generation Loss: 600 MW Percent of Loss to First Contingency: 56 %
 Load Loss: _____ MW export Maximum Interchange Deviation: 120 MW

Time to return ACE to initial (T-4) value: _____ minutes
 Time to return ACE to zero: 01:15 minutes Runback? (Y/N) N

Freq. (@T-4) 59,9900 Freq. (after) 60,0138 Freq. Dev. 0,0237
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Comments: The fault in phase A of LG2A SF6 Breaker 300-22 triggered the differential protections of both Bus 1 and Transformer 22. The bus protection sent a direct transfer trip signal to Radisson, which tripped Line 3162. Both Generators 21 and 22 were then separated from the system (Breaker 300-27 was open at the time). Reference: EA Process 20110620_1402_Radisson L3162

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8987	4162	3969	-391
T-56 sec					T+36 sec	59,8980	4162	3964	-430
T-52 sec	60,0143	4162	4000	31	T+40 sec	59,9100	4162	3990	-419
T-48 sec	60,0170	4162	4004	67	T+44 sec	59,9370	4162	3988	-360
T-44 sec	60,0060	4162	4002	62	T+48 sec	59,9600	4162	3997	-221
T-40 sec	59,9933	4162	4001	9	T+52 sec	59,9773	4162	3990	-144
T-36 sec	59,9840	4162	3997	-40	T+56 sec	59,9913	4162	4021	-79
T-32 sec	59,9773	4162	3996	-77	T+60 sec	59,9850	4162	4013	-67
T-28 sec	59,9767	4162	3994	-100	T+2 min	60,0340	4162	4088	204
T-24 sec	59,9770	4162	3992	-99	T+3 min	60,0200	4162	4091	70
T-20 sec	59,9960	4162	4000	-79	T+4 min	59,9780	4162	4068	-86
T-16 sec	60,0133	4162	3996	3	T+5 min	59,9990	4162	4073	-22
T-12 sec	60,0240	4162	3991	74	T+6 min	60,0100	4162	4076	32
T-08 sec	60,0137	4162	3994	96	T+7 min	59,9780	4162	4061	-84
T-04 sec	59,9923	4162	3993	35	T+8 min	59,9860	4162	4069	-131
T=0 sec	59,9770	4162	3998	-54	T+9 min	60,0370	4162	4086	125
T+04 sec	59,9450	4162	3941	-110	T+10 min	60,0330	4162	4086	158
T+08 sec	59,5597	4162	3872	-266	T+11 min	60,0300	4162	4084	112
T+12 sec	59,6440	4162	3942	-1725	T+12 min	60,0400	4162	4090	165
T+16 sec	59,7933	4162	3945	-1381	T+13 min	59,9820	4162	4081	-98
T+20 sec	59,8843	4162	3942	-699	T+14 min	60,0070	4162	4094	44
T+24 sec	59,8970	4162	3948	-516	T+15 min	59,9880	4162	4084	-34
T+28 sec	59,9037	4162	3949	-395					

Report No. ATR_HQT_2011_06_27_10_MANICOUAGAN_780 MW Date: 06-27-11 Time: 09:47:24
QUÉBEC

Origin: Generation loss at Churchill Falls (units 4 and 6).

Cause: The 735-kV Circuit breaker 700-17 was opened at Manicouagan Substation by human error.

Generation Loss: 780 MW Percent of Loss to First Contingency: 66 %
 Load Loss: _____ MW Maximum Interchange Deviation: 167 MW

Time to return ACE to initial (T-4) value: 01:53 minutes
 Time to return ACE to zero: 01:56 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 59,9857 Freq. (after) 59,9923 Freq. Dev. 0,0066

Comments: _____

See Comment File: _____

See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8563	3663	3594	-634
T-56 sec					T+36 sec	59,8400	3663	3600	-625
T-52 sec	60,0160	3663	3683	32	T+40 sec	59,8213	3663	3608	-667
T-48 sec	60,0320	3663	3673	83	T+44 sec	59,8277	3663	3612	-750
T-44 sec	60,0343	3663	3673	142	T+48 sec	59,8410	3663	3608	-686
T-40 sec	60,0290	3663	3676	143	T+52 sec	59,8490	3663	3618	-643
T-36 sec	60,0250	3663	3674	115	T+56 sec	59,8537	3663	3639	-613
T-32 sec	60,0127	3663	3682	97	T+60 sec	59,8710	3663	3636	-613
T-28 sec	59,9987	3663	3679	35	T+2 min	60,0150	3663	3680	40
T-24 sec	59,9950	3663	3681	-16	T+3 min	60,0010	3663	3705	53
T-20 sec	59,9967	3663	3683	-17	T+4 min	60,0290	3663	3694	101
T-16 sec	59,9927	3663	3683	-14	T+5 min	60,0330	3663	3704	93
T-12 sec	59,9920	3663	3688	-38	T+6 min	60,0080	3663	3698	90
T-08 sec	59,9930	3663	3678	-30	T+7 min	60,0110	3663	3675	47
T-04 sec	59,9857	3663	3676	-34	T+8 min	60,0820	3663	3705	351
T=0 sec	59,9800	3663	3626	-73	T+9 min	60,0200	3663	3693	103
T+04 sec	59,6747	3663	3509	-87	T+10 min	60,0360	3663	3680	157
T+08 sec	59,4327	3663	3575	-1649	T+11 min	60,0100	3663	3684	59
T+12 sec	59,4860	3663	3554	-2199	T+12 min	59,9980	3663	3675	-14
T+16 sec	59,7233	3663	3573	-1532	T+13 min	59,9860	3667	3669	-88
T+20 sec	59,8107	3663	3576	-992	T+14 min	59,9900	3667	3659	-83
T+24 sec	59,8150	3663	3596	-834	T+15 min	59,9950	3667	3650	-16
T+28 sec	59,8390	3663	3603	-734					

Report No. ATR_HQT_2011_06_29_15_NIKAMO_531 MW Date: 06-29-11 Time: 14:20:36
QUÉBEC

Origin: Generation loss at Laforge-1 GS (units 11 and 13), Laforge-2 GS (unit 22) and Brisay GS (unit 1).

Cause: Tripping of two 315-kV lines (3168 and 3169) caused by a thunderstorm.

Generation Loss: 531 MW Percent of Loss to First Contingency: 48 %
 Load Loss: _____ MW Maximum Interchange Deviation: 98 MW

Time to return ACE to initial (T-4) value: _____ minutes
 Time to return ACE to zero: 01:43 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 60,0147 Freq. (after) 60,0160 Freq. Dev. 0,0013

Comments: _____

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8960	3819	3569	-356
T-56 sec					T+36 sec	59,9310	3819	3578	-364
T-52 sec	60,0297	3819	3631	145	T+40 sec	59,9550	3819	3580	-251
T-48 sec	60,0240	3819	3638	114	T+44 sec	59,9340	3819	3582	-155
T-44 sec	60,0113	3819	3625	89	T+48 sec	59,9410	3819	3586	-247
T-40 sec	59,9967	3819	3619	28	T+52 sec	59,9530	3819	3589	-232
T-36 sec	60,0020	3819	3626	-25	T+56 sec	59,9483	3819	3601	-180
T-32 sec	60,0087	3819	3622	17	T+60 sec	59,9570	3819	3599	-206
T-28 sec	60,0107	3819	3623	39	T+2 min	60,0180	3819	3647	84
T-24 sec	60,0130	3819	3621	46	T+3 min	60,0470	3819	3647	199
T-20 sec	60,0163	3819	3624	62	T+4 min	59,9880	3819	3686	-16
T-16 sec	60,0137	3819	3624	62	T+5 min	59,9880	3819	3748	-19
T-12 sec	60,0180	3819	3626	58	T+6 min	60,0030	3819	3736	78
T-08 sec	60,0180	3819	3624	76	T+7 min	59,9950	3819	3727	21
T-04 sec	60,0147	3819	3623	70	T+8 min	60,0100	3819	3728	40
T=0 sec	60,0120	3819	3611	57	T+9 min	59,9750	3819	3715	-102
T+04 sec	59,9560	3819	3582	46	T+10 min	59,9890	3819	3711	-36
T+08 sec	59,6417	3819	3525	-230	T+11 min	59,9970	3819	3725	-72
T+12 sec	59,7090	3819	3573	-1356	T+12 min	60,0570	3819	3751	214
T+16 sec	59,8170	3819	3558	-1106	T+13 min	60,0080	3819	3720	76
T+20 sec	59,8950	3819	3561	-630	T+14 min	59,9950	3819	3717	-26
T+24 sec	59,9120	3819	3566	-442	T+15 min	60,0040	3819	3722	18
T+28 sec	59,9107	3819	3568	-326					

Report No. ATR_HQT_2011_07_01_10_MANIC_775 MW Date: 07-01-11 Time: 09:35:51
QUÉBEC

Origin: Generation rejection at Churchill Falls GS (units 4 and 6).

Cause: During an operation to isolate 735-kV circuit breaker 700-56, one phase of the C.B. remained closed.
So one phase of the Reactor XL6 was de-energized when the disconnect switch 56B22 was opened.
The 735-kV Line 7028 tripped and reclosed at Manic substation and the generation rejection occurred.

Generation Loss: 775 MW Percent of Loss to First Contingency: 76 %
 Load Loss: _____ MW export Maximum Interchange Deviation: 229 MW

Time to return ACE to initial (T-4) value: 02:52 minutes
 Time to return ACE to zero: 03:11 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 59,9717 Freq. (after) 60,0138 Freq. Dev. 0,0421

Comments: The disconnecting switch 56B22 was damaged.

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8363	3298	3150	-672
T-56 sec					T+36 sec	59,8260	3298	3162	-638
T-52 sec	59,9873	3298	3230	-45	T+40 sec	59,8113	3298	3155	-670
T-48 sec	59,9950	3298	3231	-52	T+44 sec	59,8133	3298	3170	-729
T-44 sec	60,0053	3298	3232	-8	T+48 sec	59,8270	3298	3168	-677
T-40 sec	60,0153	3298	3236	31	T+52 sec	59,8270	3298	3167	-650
T-36 sec	60,0180	3298	3236	73	T+56 sec	59,8303	3298	3201	-657
T-32 sec	60,0090	3298	3240	64	T+60 sec	59,8340	3298	3183	-648
T-28 sec	60,0037	3298	3236	24	T+2 min	59,8320	3298	3217	-661
T-24 sec	59,9980	3298	3240	16	T+3 min	59,9860	3298	3247	-37
T-20 sec	59,9887	3298	3240	-16	T+4 min	60,0440	3298	3271	164
T-16 sec	59,9760	3298	3240	-59	T+5 min	59,9720	3298	3272	-106
T-12 sec	59,9700	3298	3232	-106	T+6 min	60,0360	3298	3284	107
T-08 sec	59,9697	3298	3233	-120	T+7 min	60,0010	3298	3285	54
T-04 sec	59,9717	3298	3229	-118	T+8 min	60,0610	3298	3288	259
T=0 sec	59,9720	3298	3230	-111	T+9 min	60,0230	3298	3281	57
T+04 sec	59,9560	3298	3223	-109	T+10 min	59,9650	3298	3271	-115
T+08 sec	59,3300	3298	3001	-182	T+11 min	60,0120	3298	3277	45
T+12 sec	59,4640	3298	3108	-2409	T+12 min	60,0580	3298	3302	224
T+16 sec	59,6320	3298	3128	-1910	T+13 min	60,0300	3298	3284	62
T+20 sec	59,7167	3298	3116	-1236	T+14 min	60,0370	3298	3288	162
T+24 sec	59,7730	3298	3145	-1042	T+15 min	59,9950	3298	3271	8
T+28 sec	59,8130	3298	3143	-802					

Report No. ATR_HQT_2011_07_17_11_La Grande-2_572MW Date: 07-17-11 Time: 10:37:21

QUÉBEC

Origin: Generation loss at La Grande-2 GS (units 5 and 6).

Cause: Tripping of 735/13,8-kV Power Transformer 3 caused by low pressure in the oleo-pneumatic tank of unit 6.

Generation Loss: 572 MW Percent of Loss to First Contingency: 56 %
 Load Loss: _____ MW Maximum Interchange Deviation: 134 MW

Time to return ACE to initial (T-4) value: _____ minutes
 Time to return ACE to zero: 01:27 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 60,0173 Freq. (after) 59,9930 Freq. Dev. -0,0243

Comments: _____

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8853	3651	3619	-482
T-56 sec					T+36 sec	59,9120	3651	3625	-417
T-52 sec	60,0253	3651	3672	-6	T+40 sec	59,9387	3651	3627	-326
T-48 sec	60,0620	3651	3674	150	T+44 sec	59,9603	3651	3637	-218
T-44 sec	60,0650	3651	3665	266	T+48 sec	59,9610	3651	3645	-161
T-40 sec	60,0477	3651	3666	251	T+52 sec	59,9703	3651	3627	-152
T-36 sec	60,0300	3651	3676	176	T+56 sec	59,9997	3651	3632	-107
T-32 sec	60,0233	3651	3671	111	T+60 sec	59,9940	3651	3635	-53
T-28 sec	60,0307	3651	3666	101	T+2 min	60,0180	3651	3672	65
T-24 sec	60,0380	3651	3668	135	T+3 min	60,0370	3651	3687	116
T-20 sec	60,0373	3651	3676	157	T+4 min	60,0290	3651	3687	153
T-16 sec	60,0333	3651	3680	151	T+5 min	59,9770	3651	3670	-99
T-12 sec	60,0250	3651	3681	131	T+6 min	60,0200	3651	3685	53
T-08 sec	60,0207	3651	3677	98	T+7 min	60,0390	3651	3711	156
T-04 sec	60,0173	3651	3666	83	T+8 min	60,0220	3651	3707	83
T=0 sec	60,0050	3651	3656	66	T+9 min	60,0350	3651	3702	117
T+04 sec	59,8783	3651	3591	3	T+10 min	59,9800	3651	3690	-29
T+08 sec	59,4867	3651	3532	-607	T+11 min	59,9960	3651	3695	-32
T+12 sec	59,7020	3651	3607	-1593	T+12 min	59,9850	3651	3688	-55
T+16 sec	59,8433	3651	3595	-1049	T+13 min	59,9960	3651	3672	4
T+20 sec	59,8963	3651	3580	-484	T+14 min	60,0060	3651	3666	-21
T+24 sec	59,8870	3651	3605	-459	T+15 min	60,0000	3651	3668	8
T+28 sec	59,8803	3651	3613	-448					

Report No. ATR_HQT_2011_07_28_23_EASTMAIN-1_697MW Date: 07-28-11 Time: 22:23:34
QUÉBEC

Origin: Generation loss at Eastmain-1 GS (464 MW) and Eastmain-1-A GS (233 MW).

Cause: Tripping of three 315-kV Lines: 3176, 3177 (between Nemiscau TS and Eastmain-1 GS) and 3190 (between Nemiscau TS and Eastmain-1-A GS) caused by a thunderstorm.

Generation Loss: 697 MW Percent of Loss to First Contingency: 58 %
 Load Loss: _____ MW Maximum Interchange Deviation: 94 MW

Time to return ACE to initial (T-4) value: _____ minutes
 Time to return ACE to zero: 02:39 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 60,0057 Freq. (after) 59,9880 Freq. Dev. -0,0177

Comments: _____

See Comment File: _____

See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,86	4175	4125	-599
T-56 sec					T+36 sec	59,88	4175	4131	-525
T-52 sec	60,03	4175	4188	173	T+40 sec	59,88	4175	4130	-481
T-48 sec	60,01	4175	4192	112	T+44 sec	59,90	4175	4127	-478
T-44 sec	60,01	4175	4188	40	T+48 sec	59,90	4175	4133	-414
T-40 sec	60,03	4175	4196	48	T+52 sec	59,91	4175	4131	-393
T-36 sec	60,06	4175	4192	186	T+56 sec	59,90	4175	4136	-366
T-32 sec	60,05	4175	4191	248	T+60 sec	59,90	4175	4142	-389
T-28 sec	60,04	4175	4191	205	T+2 min	59,98	4175	4170	-106
T-24 sec	60,02	4175	4185	137	T+3 min	60,02	4175	4200	58
T-20 sec	60,01	4175	4187	72	T+4 min	60,03	4175	4203	128
T-16 sec	60,00	4175	4188	28	T+5 min	59,99	4175	4190	-94
T-12 sec	60,00	4175	4190	9	T+6 min	60,01	4175	4181	11
T-08 sec	60,01	4175	4183	23	T+7 min	60,01	4175	4188	45
T-04 sec	60,01	4175	4176	37	T+8 min	60,03	4175	4174	116
T=0 sec	59,83	4175	4129	17	T+9 min	60,06	4175	4177	269
T+04 sec	59,46	4175	4082	-938	T+10 min	60,03	4175	4186	143
T+08 sec	59,54	4175	4082	-2632	T+11 min	60,01	4175	4203	36
T+12 sec	59,81	4175	4119	-1299	T+12 min	60,04	4175	4194	207
T+16 sec	59,89	4175	4116	-631	T+13 min	60,03	4175	4199	126
T+20 sec	59,88	4175	4113	-394	T+14 min	59,99	4175	4173	-44
T+24 sec	59,86	4175	4115	-572	T+15 min	59,99	4175	4179	-64
T+28 sec	59,85	4175	4122	-605					

Report No. ATR_HQT_2011_08_01_12_SAINTE-MARGUERITE-3_652 MW Date: 08-01-11 Time: 11:40:33
QUÉBEC

Origin: Generation loss at Sainte-Marguerite-3 GS (units 1 and 2).
Unit 1 was lost at 11:40:25 and Unit 2 was lost at 11:41:10 when the frequency was 59,96 Hz.
Cause: SM3 GS tripped during an interruption of the 120-kV CA supply caused by the failure of an inverter
in an UPS (uninterruptible power supply). Protection systems and alarm or protection thresholds
were lost. The power supply of the inverter was replaced and the UPS was back by August 25th.

Generation Loss: 652 MW Percent of Loss to First Contingency: 46 %
Load Loss: _____ MW Maximum Interchange Deviation: 139 MW

Time to return ACE to initial (T-4) value: 02:02 minutes Runback? (Y/N) N
Time to return ACE to zero: 02:09 minutes Included in DCS? (Y/N) N
Freq. (@T-4) 60,0100 Freq. (after) 60,0138 Freq. Dev. 0,0038 Reviewed by Area? (Y/N) N
Reviewed by CO-1? (Y/N) N

Comments: The analysis could not identify the automatic control that initiated the tripping of the GS, maybe
because of a loss of data. The 120-kV CA supply was transferred on the HQ network and the
auxiliaries were assured by maintaining Unit 2 in operation at all time.

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec	60,0200	4669	4639	121	T+32 sec	59,9500	4669	4511	-142
T-56 sec					T+36 sec	59,9600	4669	4570	-221
T-52 sec	60,0100	4669	4634	89	T+40 sec	59,9600	4669	4570	-221
T-48 sec	60,0100	4669	4635	50	T+44 sec	59,7267	4669	4493	-431
T-44 sec	60,0033	4669	4634	32	T+48 sec	59,8000	4669	4531	-1145
T-40 sec	59,9900	4669	4632	-3	T+52 sec	59,8000	4669	4531	-1145
T-36 sec	59,9800	4669	4632	-61	T+56 sec	59,9833	4669	4533	-337
T-32 sec	59,9833	4669	4635	-66	T+60 sec	59,9100	4669	4532	-660
T-28 sec	59,9900	4669	4632	-78	T+2 min	59,9700	4669	4562	-16
T-24 sec	59,9900	4669	4632	-58	T+3 min	60,0300	4669	4582	96
T-20 sec	59,9867	4669	4632	-69	T+4 min	60,0100	4669	4578	53
T-16 sec	59,9800	4669	4628	-92	T+5 min	60,0000	4669	4586	-47
T-12 sec	59,9900	4669	4626	-70	T+6 min	59,9900	4669	4575	-37
T-08 sec	59,9967	4669	4636	-51	T+7 min	60,0300	4669	4579	81
T-04 sec	60,0100	4669	4633	-12	T+8 min	60,0000	4669	4573	75
T=0 sec	59,7900	4669	4631	-367	T+9 min	60,0000	4669	4604	-8
T+04 sec	59,7900	4669	4552	-367	T+10 min	59,9900	4669	4621	-40
T+08 sec	59,8900	4669	4572	-1453	T+11 min	59,9900	4669	4627	-48
T+12 sec	59,9300	4669	4599	-451	T+12 min	59,9800	4669	4624	-30
T+16 sec	59,9300	4669	4600	-451	T+13 min	60,0000	4669	4621	-33
T+20 sec	59,9800	4669	4600	-60	T+14 min	60,0200	4669	4617	73
T+24 sec	59,9600	4669	4619	-216	T+15 min	59,9700	4669	409	-150
T+28 sec	59,9467	4669	4619	-117					

Report No. ATR_HQT_2011_08_01_15_RIO TINTO ALCAN_585 MW Date: 08-01-11 Time: 14:30:54

QUÉBEC

Origin: Generation loss at 345/14,4-kV Chute-des-Passes GS owned by Rio Tinto Alcan, a neighbouring network.

Cause: Tripping of 345-kV Lines 61 & 62 linking Chute-des-Passes GS with 345/13,2-kV Delisle Substation, caused by a lightning storm.

Generation Loss: 585 MW Percent of Loss to First Contingency: 42 %
 Load Loss: _____ MW Maximum Interchange Deviation: 612 MW

Time to return ACE to initial (T-4) value: 01:20 minutes
 Time to return ACE to zero: 01:25 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 59,9957 Freq. (after) 59,9930 Freq. Dev. -0,0027

Comments: _____

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,9033	5725	6250	-559
T-56 sec					T+36 sec	59,9300	5725	6261	-427
T-52 sec	60,0227	5725	5693	88	T+40 sec	59,9673	5725	6291	-289
T-48 sec	60,0140	5725	5691	108	T+44 sec	60,0130	5725	6294	-109
T-44 sec	60,0047	5725	5700	49	T+48 sec	60,0070	5725	6285	39
T-40 sec	60,0053	5725	5693	19	T+52 sec	59,9910	5725	6298	32
T-36 sec	60,0050	5725	5684	28	T+56 sec	59,9667	5725	6290	-59
T-32 sec	60,0000	5725	5689	15	T+60 sec	59,9630	5725	6299	-102
T-28 sec	59,9967	5725	5683	-1	T+2 min	60,0340	5725	6323	147
T-24 sec	59,9980	5725	5684	-23	T+3 min	60,0610	5725	6229	314
T-20 sec	60,0033	5725	5690	-3	T+4 min	60,0050	5725	6210	28
T-16 sec	60,0073	5725	5692	21	T+5 min	60,0270	5725	6163	111
T-12 sec	60,0020	5725	5694	36	T+6 min	60,0350	5725	5952	207
T-08 sec	59,9957	5725	5695	1	T+7 min	59,9960	5725	5927	19
T-04 sec	59,9957	5725	5686	-21	T+8 min	59,9890	5725	5802	-103
T=0 sec	59,8610	5725	6076	-19	T+9 min	60,0250	5725	5805	77
T+04 sec	59,5450	5725	6227	-855	T+10 min	60,0210	5725	5708	71
T+08 sec	59,5873	5725	6185	-2478	T+11 min	59,9770	5725	5551	-133
T+12 sec	59,7940	5725	6211	-1379	T+12 min	60,0230	5725	5457	145
T+16 sec	59,8673	5725	6221	-814	T+13 min	59,9970	5725	5449	-3
T+20 sec	59,8823	5725	6220	-533	T+14 min	59,9960	5725	5498	-3
T+24 sec	59,8670	5725	6248	-618	T+15 min	60,0160	5725	5494	134
T+28 sec	59,8777	5725	6257	-614					

Report No. ATR_HQT_2011_08_18_16_EASTMAIN-1_514 MW Date: 08-18-11 Time: 15:40:42
QUÉBEC

Origin: Generation loss at Eastmain-1 GS (285 MW, units 2 and 3) and Eastmain-1A GS (229 MW, Unit A11).

Cause: Tripping of 315-kV Line 3176 at Eastmain-1 Substation caused by lightning located near tower #35.

Generation Loss: 514 MW Percent of Loss to First Contingency: 41 %
 Load Loss: _____ MW Maximum Interchange Deviation: 89 MW

Time to return ACE to initial (T-4) value: _____ minutes
 Time to return ACE to zero: 01:21 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) N
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 60,0520 Freq. (after) 59,9880 Freq. Dev. -0,0640

Comments: The Line was back at 15:49:49.

See Comment File: _____

See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,90	5544	5570	-502
T-56 sec					T+36 sec	59,90	5544	5574	-454
T-52 sec	59,99	5544	5603	-54	T+40 sec	59,92	5544	5575	-445
T-48 sec	60,00	5544	5605	-19	T+44 sec	59,94	5544	5579	-367
T-44 sec	60,00	5544	5605	5	T+48 sec	59,96	5544	5579	-282
T-40 sec	60,00	5544	5604	-7	T+52 sec	59,97	5544	5596	-187
T-36 sec	60,00	5544	5611	-13	T+56 sec	59,98	5544	5588	-97
T-32 sec	60,00	5544	5601	-2	T+60 sec	59,98	5544	5592	-121
T-28 sec	59,99	5544	5599	-29	T+2 min	60,04	5544	5636	217
T-24 sec	59,99	5544	5603	-67	T+3 min	60,00	5544	5631	26
T-20 sec	60,00	5544	5608	-49	T+4 min	60,02	5544	5616	70
T-16 sec	60,04	5544	5620	58	T+5 min	60,01	5544	5627	50
T-12 sec	60,06	5544	5621	254	T+6 min	60,00	5544	5621	-33
T-08 sec	60,06	5544	5618	302	T+7 min	60,00	5544	5618	43
T-04 sec	60,05	5544	5622	283	T+8 min	59,99	5544	5608	-26
T=0 sec	60,04	5544	5625	235	T+9 min	59,98	5544	5602	-82
T+04 sec	60,03	5544	5592	186	T+10 min	60,00	5544	5606	-34
T+08 sec	59,77	5544	5553	126	T+11 min	59,99	5544	5605	-12
T+12 sec	59,66	5544	5565	-1507	T+12 min	60,04	5544	5618	174
T+16 sec	59,77	5544	5572	-1618	T+13 min	59,99	5544	5617	-39
T+20 sec	59,87	5544	5532	-942	T+14 min	60,01	5544	5627	81
T+24 sec	59,88	5544	5561	-624	T+15 min	60,00	5544	5565	19
T+28 sec	59,89	5544	5559	-527					

Report No. ATR_HQT_2011_09_07_07_MANICOUAGAN_837 MW Date: 09-07-11 Time: 06:05:09
QUÉBEC

Origin: Generation rejection at Churchill Falls GS (units 7 and 9).

Cause: The 735-kV Line 7028 tripped at Manicouagan TS when it was put-on-load via the Circuit breaker 700-22 at Manicouagan TS. The cause was water accumulation in the junction box of the voltage transformer.

Generation Loss: 837 MW Percent of Loss to First Contingency: 92 %
 Load Loss: _____ MW Maximum Interchange Deviation: 246 MW

Time to return ACE to initial (T-4) value: 07:10 minutes
 Time to return ACE to zero: 07:26 minutes

			Runback? (Y/N)	<u>N</u>
			Included in DCS? (Y/N)	<u>Y</u>
Freq. (@T-4)	Freq. (after)	Freq. Dev.	Reviewed by Area? (Y/N)	<u>N</u>
<u>59,9750</u>	<u>60,0138</u>	<u>0,0388</u>	Reviewed by CO-1? (Y/N)	<u>N</u>

Comments: At 06:05:35 the Line 7020 was put on-load by the Circuit breaker 700-22 at Arnaud TS.

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,7963	260	94	-615
T-56 sec					T+36 sec	59,7650	260	100	-622
T-52 sec	59,9793	260	76	-69	T+40 sec	59,7383	260	102	-680
T-48 sec	59,9770	260	87	-63	T+44 sec	59,7367	260	123	-762
T-44 sec	59,9787	260	95	-68	T+48 sec	59,7900	260	130	-675
T-40 sec	59,9747	260	95	-66	T+52 sec	59,8193	260	127	-568
T-36 sec	59,9660	260	97	-84	T+56 sec	59,8070	260	136	-492
T-32 sec	59,9660	260	98	-105	T+60 sec	59,7970	260	142	-541
T-28 sec	59,9680	260	108	-101	T+2 min	59,8870	260	155	-315
T-24 sec	59,9670	260	112	-98	T+3 min	59,8780	260	144	-354
T-20 sec	59,9673	260	104	-101	T+4 min	59,8940	260	153	-358
T-16 sec	59,9707	260	108	-100	T+5 min	59,8490	260	136	-437
T-12 sec	59,9680	260	121	-85	T+6 min	59,8370	260	148	-538
T-08 sec	59,9623	260	123	-107	T+7 min	59,9560	260	200	-174
T-04 sec	59,9750	260	119	-108	T+8 min	60,0830	260	217	221
T=0 sec	59,9890	260	75	-64	T+9 min	60,1080	260	212	299
T+04 sec	59,5783	260	0	-21	T+10 min	60,0870	260	196	319
T+08 sec	59,2537	260	-127	-1485	T+11 min	60,0010	260	175	-48
T+12 sec	59,4300	260	8	-1943	T+12 min	59,9830	260	161	-89
T+16 sec	59,5207	260	28	-1507	T+13 min	60,0010	260	173	78
T+20 sec	59,5980	260	94	-1296	T+14 min	59,9970	260	154	2
T+24 sec	59,6950	260	90	-1058	T+15 min	60,0400	260	153	148
T+28 sec	59,7657	260	97	-802					

Report No. ATR_HQT_2011_10_06_06_LA VERENDRYE_884 MW Date: 10-06-11 Time: 05:49:08
QUÉBEC

Origin: Generation rejection at La Grande-2 GS (units 4, 6 and 14).

Cause: 735-kV Line 7094 was put on-load at La Verendrye TS by closing the Circuit breaker 700-2, which tripped by phase disagreement protection (failure to operate on phase C). The low-current open-line detection was activated, Line 7094 tripped at La Vérendrye TS and 3 units were rejected at La Grande-2 GS.

Generation Loss: 884 MW Percent of Loss to First Contingency: 86 %
 Load Loss: _____ MW Maximum Interchange Deviation: 172 MW

Time to return ACE to initial (T-4) value: 03:08 minutes
 Time to return ACE to zero: 03:16 minutes

Runback? (Y/N) N
 Included in DCS? (Y/N) Y
 Reviewed by Area? (Y/N) N
 Reviewed by CO-1? (Y/N) N

Freq. (@T-4) 59,9760 Freq. (after) 60,0138 Freq. Dev. 0,0377

Comments: _____

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,8107	-235	-327	-580
T-56 sec					T+36 sec	59,8070	-235	-318	-602
T-52 sec	59,9747	-235	-249	-58	T+40 sec	59,8043	-235	-310	-631
T-48 sec	59,9760	-235	-246	-92	T+44 sec	59,8200	-235	-299	-634
T-44 sec	59,9863	-235	-251	-73	T+48 sec	59,8030	-235	-309	-628
T-40 sec	59,9917	-235	-254	-40	T+52 sec	59,8043	-235	-315	-642
T-36 sec	59,9850	-235	-249	-27	T+56 sec	59,8007	-235	-322	-630
T-32 sec	59,9817	-235	-251	-56	T+60 sec	59,8100	-235	-317	-641
T-28 sec	59,9830	-235	-254	-61	T+2 min	59,8520	-235	-321	-491
T-24 sec	59,9810	-235	-251	-59	T+3 min	59,9760	-235	-300	-114
T-20 sec	59,9807	-235	-257	-65	T+4 min	60,0980	-235	-236	317
T-16 sec	59,9827	-235	-255	-67	T+5 min	60,0420	-235	-229	155
T-12 sec	59,9860	-235	-254	-56	T+6 min	59,9770	-235	-225	-78
T-08 sec	59,9840	-235	-253	-50	T+7 min	59,9900	-235	-179	-51
T-04 sec	59,9760	-235	-257	-59	T+8 min	59,9780	-235	-130	-73
T=0 sec	59,9750	-235	-294	-93	T+9 min	60,0300	-235	-67	83
T+04 sec	59,6617	-235	-358	-78	T+10 min	59,9970	-235	-6	-28
T+08 sec	59,2650	-235	-429	-1348	T+11 min	59,9910	406	64	-4
T+12 sec	59,4200	-235	-337	-2379	T+12 min	59,9830	406	144	-17
T+16 sec	59,6067	-235	-341	-1710	T+13 min	59,9810	406	247	-67
T+20 sec	59,7333	-235	-334	-1124	T+14 min	59,9540	406	302	-185
T+24 sec	59,7910	-235	-321	-836	T+15 min	59,9950	406	356	-46
T+28 sec	59,8150	-235	-328	-622					

Report No. ATR_HQT_2011_10_28_24_LA GRANDE-2 552 MW Date: 10-28-11 Time: 23:12:06

QUÉBEC

Origin: Generation loss at La Grande-2 GS (units 7 and 10).

Cause: Human error while the regional control center operator had to stop units due to a load reduction.
After stopping 4 units he was reducing the 735-kV voltage, but the 13,8-kV voltage was too much reduced, causing the tripping of the two remaining units.

Generation Loss: 552 MW Percent of Loss to First Contingency: 54 %
 Load Loss: _____ MW Maximum Interchange Deviation: 55 MW

Time to return ACE to initial (T-4) value: 00:36 minutes
 Time to return ACE to zero: 00:39 minutes

			Runback? (Y/N)	<u>N</u>
			Included in DCS? (Y/N)	<u>N</u>
Freq. (@T-4)	Freq. (after)	Freq. Dev.	Reviewed by Area? (Y/N)	<u>N</u>
<u>59,9807</u>	<u>59,9930</u>	<u>0,0123</u>	Reviewed by CO-1? (Y/N)	<u>N</u>

Comments: At 23:12 unit 7 tripped with a frequency variation of 59,71 Hz.
At 23:13 unit 10 tripped when frequency was 60,03 Hz, with a frequency variation of 59,75 Hz.

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,9717	650	598	-80
T-56 sec					T+36 sec	60,0040	650	607	-69
T-52 sec	59,9907	650	629	-19	T+40 sec	60,0267	650	616	41
T-48 sec	59,9870	650	619	-40	T+44 sec	60,0310	650	609	120
T-44 sec	59,9883	650	627	-48	T+48 sec	60,0160	650	603	90
T-40 sec	59,9890	650	623	-38	T+52 sec	60,0173	650	615	47
T-36 sec	59,9860	650	623	-44	T+56 sec	60,0420	650	624	68
T-32 sec	59,9807	650	622	-53	T+60 sec	60,0320	650	615	117
T-28 sec	59,9773	650	625	-88	T+2 min	59,9850	650	607	-62
T-24 sec	59,9840	650	621	-74	T+3 min	60,0630	650	627	156
T-20 sec	59,9887	650	625	-55	T+4 min	60,0070	650	626	42
T-16 sec	59,9907	650	623	-39	T+5 min	59,9830	650	621	-97
T-12 sec	59,9920	650	619	-33	T+6 min	59,9920	650	623	-34
T-08 sec	59,9860	650	618	-36	T+7 min	60,0180	650	625	42
T-04 sec	59,9807	650	621	-60	T+8 min	60,0440	650	633	131
T=0 sec	59,9580	650	610	-73	T+9 min	60,0350	650	635	111
T+04 sec	59,7607	650	566	-181	T+10 min	60,0200	650	639	106
T+08 sec	59,7290	650	608	-1066	T+11 min	60,0100	650	626	31
T+12 sec	59,7970	650	596	-1002	T+12 min	59,9770	650	619	-104
T+16 sec	59,8957	650	584	-667	T+13 min	59,9880	650	622	-20
T+20 sec	59,9627	650	601	-295	T+14 min	59,9780	650	639	-78
T+24 sec	59,9690	650	591	-155	T+15 min	59,9860	650	631	-60
T+28 sec	59,9770	650	599	-101					

Report No. ATR_HQT_2011_11_23_16_LA VERENDRYE_880 MW Date: 11-23-11 Time: 15:22:42
QUÉBEC

Origin: Generation rejection at La Grande-2 GS (units 2, 3 and 14).

Cause: Human error. The operator of La Vérendrye TS opened a 735-kV disconnector under load.

The electric arc caused a phase-to-earth fault by flashover.

The 735-kV Line 7016 tripped at La Vérendrye TS and Duvernay TS.

Generation Loss: 880 MW Percent of Loss to First Contingency: 93 %
 Load Loss: _____ MW Maximum Interchange Deviation: 66 MW

Time to return ACE to initial (T-4) value: 00:25 minutes

Time to return ACE to zero: 00:27 minutes

Runback? (Y/N) N

Included in DCS? (Y/N) Y

Freq. (@T-4) Freq. (after) Freq. Dev.
59,9850 60,0138 0,0288

Reviewed by Area? (Y/N) N

Reviewed by CO-1? (Y/N) N

Comments: Frequency excursion from 60 to 59,507 Hz. The operator is highly experimented.

See Comment File: _____ See Graph File(s): _____

INTERCHANGE TABLE

T = Time of Disturbance

Time	F	Sched	Actual	ACE	Time	F	Sched	Actual	ACE
T-60 sec					T+32 sec	59,9473	3400	3321	-98
T-56 sec					T+36 sec	59,9210	3400	3305	-331
T-52 sec	60,0007	3400	3351	16	T+40 sec	59,9023	3400	3305	-467
T-48 sec	59,9980	3400	3348	-2	T+44 sec	59,9020	3400	3311	-555
T-44 sec	59,9977	3400	3351	-12	T+48 sec	59,9130	3400	3307	-511
T-40 sec	59,9963	3400	3354	-13	T+52 sec	59,9250	3400	3308	-460
T-36 sec	59,9960	3400	3357	-23	T+56 sec	59,9337	3400	3316	-397
T-32 sec	60,0003	3400	3351	-17	T+60 sec	59,9370	3400	3316	-386
T-28 sec	60,0043	3400	3347	9	T+2 min	60,0270	3400	3332	56
T-24 sec	60,0050	3400	3346	30	T+3 min	60,0170	3400	3341	113
T-20 sec	60,0043	3400	3351	27	T+4 min	60,0020	3400	3348	-16
T-16 sec	60,0017	3400	3348	19	T+5 min	59,9840	3400	3334	-78
T-12 sec	59,9980	3400	3349	6	T+6 min	60,0060	3400	3343	49
T-08 sec	59,9890	3400	3347	-26	T+7 min	59,9560	3400	3346	-272
T-04 sec	59,9850	3400	3346	-73	T+8 min	60,0400	3400	3327	86
T=0 sec	59,9870	3400	3323	-85	T+9 min	60,0370	3400	3358	172
T+04 sec	59,8843	3400	3280	-66	T+10 min	59,9660	3400	3356	-194
T+08 sec	59,5140	3400	3296	-769	T+11 min	60,1680	3400	3371	555
T+12 sec	59,6390	3400	3325	-2652	T+12 min	59,9950	3400	3352	-16
T+16 sec	59,8457	3400	3331	-1745	T+13 min	60,0060	3400	3345	-7
T+20 sec	59,9840	3400	3335	-561	T+14 min	59,9870	3400	3288	-69
T+24 sec	59,9990	3400	3335	-137	T+15 min	59,9950	3400	3293	-22
T+28 sec	59,9857	3400	3318	41					

**NPCC DISTURBANCE REPORTING FORM
B-13**

REPORT OF:	INTERRUPTION	<input type="checkbox"/>	
	VOLTAGE REDUCTION	<input type="checkbox"/>	<input type="text" value=""/> %
	PUBLIC APPEAL	<input type="checkbox"/>	
	VULNERABILITY ACTION	<input type="checkbox"/>	
	OTHER INCIDENT	<input checked="" type="checkbox"/>	
UTILITY:	<input type="text" value="Hydro-Quebec TransEnergie"/>		
DIVISION :	<input type="text" value="CCME"/>		
ADDRESS:	<input type="text" value="2, Complexe Desjardins
Tour de l'Est, B1 floor
C.P. 10 000
Montréal, (Quebec) H5B 1H7"/>		
REPORTED BY:	<input type="text" value="(Name) Richard Mailhot
(Title) Chief of operation"/>		
PHONE NUMBER(S) (INCLUDE AREA CODE)	<input type="text" value="Office (514) 289-2211 ext. 4368
Fax (514) 289-4556"/>		

DESCRIPTION OF EVENT

SYSTEM(S) AND/OR AREA(S) AFFECTED:

DATE AND TIME AT WHICH THE INCIDENT BEGAN:
DATE (mm-dd-yyyy): TIME (hh:mm:ss): TIME ZONE:

**DATE AND TIME OF SERVICE RESTORATION RETURN TO NORMAL VOLTAGE LEVELS
OR RETURN TO NORMAL SYSTEM OPERATIONS:**

INITIAL
DATE (mm-dd-yyyy): TIME (hh:mm:ss): TIME ZONE:

FINAL
DATE (mm-dd-yyyy): TIME (hh:mm:ss): TIME ZONE:

NUMBER OF CUSTOMERS AFFECTED

AMOUNT OF LOAD INVOLVED

NARRATIVE DESCRIPTION OF THE NPCC DISTURBANCE

UTILITY DATE OF THE INCIDENT(mm-dd-yyyy)

PROVIDE A BRIEF DESCRIPTION OF THE EVENT. INCLUDE AS APPROPRIATE: THE CAUSE OF THE INCIDENT, EQUIPMENT DAMAGED, CRITICAL SERVICES INTERRUPTED, AND ANY EFFECTS ON NEIGHBORING SYSTEM(S):

At 05:18 on May 11, 2011
A 735 kV line, L7034, between Nicolet and Boucherville substation in the Montreal area, tripped due to a landslide causing the loss of a tower (number 492). The line correctly tripped following a single fault but when the automatic reclosing operated the fault was now two phases to ground. That second fault on the line led to the loss of 800 MW of sensitive load and a momentarily (8 minutes) reduction of 300 MW of import from Ontario on the Ouvaouais DC converter (run back).
The frequency deviation was from 60.00 to 60.38 Hz.
No other impacts were noted and load was recovered at 05:47.

NERC Interconnection Reliability Operating Limit and Preliminary Disturbance Report

Check here if this is an Interconnection Reliability Operating Limit (IROL) violation report.

1.	Organization filing the report:	Contrôle et exploitation du réseau (Hydro-Québec TransÉnergie)	
2.	Name of person filing report: Email address: Telephone Number:	Richard Mailhot mailhot.richard@hydro.qc.ca (514)289-2211 ext 4368	
3.	Date and Time of disturbance. Date: (yyyy-mm-dd) Time/Zone: (hh:mm:ss)	2011-05-24 02:01:35 EST	
4.	Did the event originate in your system?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
5.	Under which NERC function are you reporting?	RC <input checked="" type="checkbox"/> BA <input checked="" type="checkbox"/> TO/TOP <input checked="" type="checkbox"/> LSE <input type="checkbox"/> GO/GOP <input type="checkbox"/> Other <input type="checkbox"/> [explain]	
6.	Describe disturbance including: cause, equipment damage, critical services interrupted, system separation, key scheduled and actual flows prior to disturbance and in the case of a disturbance involving a special protection or remedial action scheme, what action is being taken to prevent recurrence.	A lightning storm in the Churchill Falls-Manicouagan region resulted in a fault on the regional line 1618 (161 kV) at the Arnaud 735 kV/161 kV substation. The correct breakers opened to clear the fault. That action, in the particular 161 kV grid configuration resulting from a breaker outage for maintenance, caused the loss of 450 MW of load at the local aluminium smelter plant and 64 MW of other smaller loads. In addition, an other 450 MW of voltage sensitive load from the same aluminium plant also tripped due to the same fault. The system voltage and frequency rapidly returned to normal.	
7.	Generation tripped off-line. MW Total List units tripped	0 MW	
8.	Frequency. Just prior to disturbance (Hz): Immediately after disturbance (Hz max): Immediately after disturbance (Hz min):	60 Hz 60.86 hZ	
9.	List transmission lines tripped (specify voltage level of each line).	1618 , 1619 , 1617 and 1651, all at 161 kV.	
10.	Demand tripped (MW): Number of affected customers:	FIRM 964 MW	INTERRUPTIBLE

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The present report contains confidential information as defined in section 1501 of NERC Rules of Procedure and may not be disclosed or copied without prior written consent of Hydro-Québec TransÉnergie.

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		Demand lost (MW-Minutes):	
11.	Restoration Time.		
		Transmission:	20s
		Generation:	
		Demand:	16m
		INITIAL	FINAL
		20s	16m
		16m	1h35

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