



SEQUENCE OF SIMULATION - MEXICO L12

Revision History

REV.	DESCRIPTION	DATE	RESPONSIBLE		
			ELAB.	CHECK.	APPROV.
00	Servicio Continuo	4-Nov-09	R.Valentim	M.Chagas	P.Decottignies
	Servicio de afluencia				
	Sequence of Simulation-R00				

00012864



CYCLES - MEXICO L12



Revision History

REV.	DESCRIPTION	DATE	RESPONSIBLE		
			ELAB.	CHECK.	APPROV.
00	Cycles - R00	3-Nov-09	R.Valentim	M.Chagas	P.Decottignies
	Cycles A1, A2, B1 and B2				
	GRAPHIC-CYCLE A1				
	GRAPHIC-CYCLE B1				
	GRAPHIC-CYCLE A2				
	GRAPHIC-CYCLE B2				

00012865

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012866

Cycle A1

7C 5M AW1 4p/m²

Average acceleration from 0 to 40Km/h	1.12 m/s ²
Time from 0 to 80Km/h	29.1 s
Coastin time	3.00 s
Stop Time	17.0 s
Cycle time	52.4 s
Total Distance	680.000001 m

time(s)	distance(m)	speed(km/h)	F_elec(kN)	F_brakeP(kN)	gamma(m/s2)
0	0	0	397.1814913	0	1.13355058
0.1	0.07528448	0.408078209	397.1814913	0	1.13355058
0.2	0.15056896	0.816156418	397.1814913	0	1.13355058
0.3	0.225853439	1.224234626	397.1814913	0	1.13355058
0.4	0.301137919	1.632312835	397.1814913	0	1.13355058
0.5	0.376422399	2.040391044	397.1814913	0	1.13355058
0.6	0.451706879	2.448469253	397.1814913	0	1.13355058
0.7	0.526991359	2.856547461	397.1814913	0	1.13355058
0.8	0.602275838	3.26462567	397.1814913	0	1.13355058
0.9	0.677560318	3.672703879	397.1814913	0	1.13355058
1	0.752844798	4.080782088	397.1814913	0	1.13355058
1.1	0.828129278	4.488860297	397.1814913	0	1.13355058
1.2	0.903413758	4.896938505	397.1814913	0	1.13355058
1.3	0.978698237	5.305016714	397.1814913	0	1.13355058
1.4	1.130312929	5.712897477	397.1814761	0	1.133450905
1.5	1.312047779	6.120700326	397.1814549	0	1.133311899
1.6	1.493782629	6.528503175	397.1814337	0	1.133172892
1.7	1.675517479	6.936306025	397.1814125	0	1.133033885
1.8	1.85725233	7.344108874	397.1813913	0	1.132894879
1.9	2.05080248	7.751883983	397.1813705	0	1.132767445
2	2.287613174	8.159557525	397.1813508	0	1.132682385
2.1	2.524423867	8.567231066	397.1813311	0	1.132597326
2.2	2.761234561	8.974904608	397.1813114	0	1.132512266
2.3	2.998045255	9.38257815	397.1812917	0	1.132427206
2.4	3.278555924	9.790147316	397.1812725	0	1.13234507
2.5	3.559430315	10.19771561	397.1812533	0	1.132262958
2.6	3.840304707	10.60528391	397.1812341	0	1.132180846
2.7	4.137533479	11.01281218	397.1812149	0	1.132098711
2.8	4.456314796	11.42028769	397.1811958	0	1.132016548
2.9	4.775096112	11.8277632	397.1811767	0	1.131934384
3	5.103831454	12.23521373	397.1811576	0	1.131851951
3.1	5.456413842	12.64260441	397.1811384	0	1.131768874
3.2	5.80899623	13.0499951	397.1811193	0	1.131685796
3.3	6.175695012	13.4573495	397.1811001	0	1.131602153
3.4	6.55908093	13.86466101	397.1810809	0	1.131517841
3.5	6.942466849	14.27197253	397.1810616	0	1.131433529
3.6	7.350065817	14.6792204	397.1810423	0	1.131348061
3.7	7.761939884	15.08645704	397.1810229	0	1.131262389
3.8	8.185051516	15.4936635	397.1810034	0	1.131176125
3.9	8.623554407	15.90082865	397.1809839	0	1.13108905
4	9.065608417	16.30798407	397.1809643	0	1.131001775
4.1	9.529203855	16.71508051	397.1809446	0	1.130913291
4.2	9.992799293	17.12217694	397.1809248	0	1.130824807
4.3	10.47982027	17.52920802	397.1809049	0	1.13073495

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012867

4.4	10.96721084	17.93623807	397.180885	0	1.130645071
4.5	11.4757559	18.34320805	397.1808648	0	1.130553912
4.6	11.98582677	18.75017369	397.1808447	0	1.13046266
4.7	12.51700322	19.1570784	397.1808243	0	1.130370101
4.8	13.05069577	19.56397574	397.1808039	0	1.130277384
4.9	13.60332768	19.97081753	397.1807834	0	1.130183473
5	14.16162913	20.37764242	397.1807628	0	1.130089198
5.1	14.73435063	20.78442437	397.180742	0	1.129994
5.2	15.31747629	21.19117487	397.1807211	0	1.129898129
5.3	15.90960262	21.59789817	397.1807001	0	1.129801674
5.4	16.51764655	22.0045727	397.180679	0	1.129704179
5.5	17.13239292	22.41122653	397.1806577	0	1.129606243
5.6	17.76152656	22.81783568	397.1806364	0	1.129507359
5.7	18.40165465	23.22441026	397.1806148	0	1.129407745
5.8	19.04978602	23.63095961	397.1805931	0	1.1293076
5.9	19.71385684	24.03745822	397.1805713	0	1.129206391
6	20.38748461	24.44392602	397.1805494	0	1.129104541
6.1	21.06999321	24.85036515	397.1809978	0	1.129002095
6.2	21.76724304	25.25675624	397.1856623	0	1.128898656
6.3	22.47515684	25.66311685	397.1918413	0	1.128803744
6.4	23.19254961	26.0694511	397.1972246	0	1.128714596
6.5	23.92146147	26.47575446	397.1982777	0	1.128629605
6.6	24.66404559	26.88201317	397.1985099	0	1.128528145
6.7	25.41651629	27.28823861	397.1966645	0	1.128422642
6.8	26.179171	27.69442831	397.1934051	0	1.128312753
6.9	26.9531373	28.10057552	397.1908554	0	1.128193911
7	27.74067138	28.50667251	397.1910745	0	1.128076708
7.1	28.5385961	28.91273334	397.1914297	0	1.127964792
7.2	29.34710799	29.31875731	397.1916982	0	1.127854929
7.3	30.16637451	29.72474355	397.1918968	0	1.127744129
7.4	30.99659325	30.13069098	397.192172	0	1.12763221
7.5	31.8402298	30.53659057	397.1927043	0	1.127519648
7.6	32.69467036	30.94245159	397.1928248	0	1.127406958
7.7	33.56002614	31.34827297	397.1913941	0	1.127292695
7.8	34.43639101	31.75405266	397.1891923	0	1.127173856
7.9	35.32384363	32.15978914	397.1878777	0	1.127050969
8	36.22244929	32.56548258	397.1880677	0	1.126929138
8.1	37.13226154	32.97113429	397.1882498	0	1.126811759
8.2	38.05332359	33.3767438	397.1883848	0	1.126693592
8.3	38.98585159	33.78230997	397.1885072	0	1.126574481
8.4	39.93020089	34.18783109	395.7638669	0	1.126454513
8.5	40.88568658	34.59183096	393.0266853	0	1.122406174
8.6	41.85227333	34.99294437	389.9488913	0	1.1144499
8.7	42.82989588	35.39080689	385.2292727	0	1.105338532
8.8	43.81845382	35.78370983	380.2757702	0	1.091514386
8.9	44.8178148	36.17139687	375.388013	0	1.07689237
9	45.82783898	36.55393657	370.5651396	0	1.06247128
9.1	46.84838457	36.93139836	365.8062842	0	1.048247996
9.2	47.87930854	37.30385217	361.1105571	0	1.034219437
9.3	48.92046728	37.67136817	356.4770815	0	1.02038249
9.4	49.97171705	38.03401652	351.9049577	0	1.006734125
9.5	51.03320167	38.39172861	347.3949421	0	0.993276614
9.6	52.10479693	38.744565	342.9463972	0	0.980007001
9.7	53.18610054	39.09272035	338.5569063	0	0.966917875
9.8	54.27696645	39.43626577	334.2256433	0	0.954006372

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls



9.9	55.37725052	39.77527142	329.9516155	0	0.941269707
10	56.48681061	40.10980638	325.7339451	0	0.928704721
10.1	57.60550664	40.43993865	321.5717713	0	0.916308575
10.2	58.73320068	40.76573518	317.4642599	0	0.904078514
10.3	59.86975696	41.08726184	313.7540907	0	0.892011864
10.4	61.01514647	41.40491184	310.696034	0	0.881289723
10.5	62.17005522	41.71906968	307.7363259	0	0.872482877
10.6	63.33349195	42.03015312	305.0516118	0	0.863763706
10.7	64.50535821	42.33852962	303.1099315	0	0.856210455
10.8	65.68557142	42.64490389	301.3182508	0	0.850560541
10.9	66.87406017	42.94941563	299.5374622	0	0.845242287
11	68.07116755	43.25198762	297.7680143	0	0.839958304
11.1	69.27716732	43.55255821	296.01027	0	0.834709646
11.2	70.49124406	43.85131092	294.2631568	0	0.82949306
11.3	71.71332967	44.14826104	292.5265833	0	0.824308259
11.4	72.94335682	44.44342372	290.8004612	0	0.819154952
11.5	74.1822173	44.73659818	289.0859662	0	0.814036659
11.6	75.42919293	45.02794606	287.3821239	0	0.80895052
11.7	76.68391384	45.31755053	285.6884007	0	0.803894917
11.8	77.94631518	45.60542609	284.0047715	0	0.798869523
11.9	79.21739314	45.89134844	282.3325717	0	0.793878434
12	80.49628912	46.17551083	280.6707279	0	0.788918308
12.1	81.78267317	46.45798757	279.0187945	0	0.783988002
12.2	83.07683704	46.73871299	277.3771028	0	0.779088538
12.3	84.37938081	47.01755196	275.7464418	0	0.774222173
12.4	85.68922379	47.29474772	274.1253856	0	0.769384623
12.5	87.00633352	47.57030753	272.5138956	0	0.764575745
12.6	88.33199595	47.84394184	270.9136661	0	0.759800614
12.7	89.66477304	48.11597435	269.3228024	0	0.755053548
12.8	91.00462596	48.38641377	267.7412534	0	0.750334379
12.9	92.35288082	48.65496147	266.1707672	0	0.745648331
13	93.70807064	48.92194769	264.6094126	0	0.740989616
13.1	95.07041636	49.18732265	263.0574784	0	0.736359097
13.2	96.44074372	49.45090036	261.5160537	0	0.731760012
13.3	97.81783149	49.71295576	259.9835316	0	0.727187551
13.4	99.20238356	49.9733303	258.4608389	0	0.722644481
13.5	100.5942722	50.23205269	256.9478061	0	0.718130291
13.6	101.992752	50.48929075	255.4434532	0	0.713642038
13.7	103.3991969	50.74473499	253.9495906	0	0.709185128
13.8	104.8121458	50.99871441	252.4642943	0	0.704753807
13.9	106.2323238	51.25106568	250.988518	0	0.700350923
14	107.6595263	51.50183481	249.5219939	0	0.695975662
14.1	109.0933577	51.75111085	248.0642016	0	0.69162647
14.2	110.5345994	51.99871776	246.6542571	0	0.687306415
14.3	111.9820511	52.24497627	245.3989514	0	0.683213333
14.4	113.4370666	52.48976227	244.1901705	0	0.679590272
14.5	114.8982539	52.73336986	242.9872088	0	0.675988969
14.6	116.3666523	52.97560052	241.8133872	0	0.672407949
14.7	117.8413926	53.2166564	240.7667299	0	0.668993193
14.8	119.3230924	53.45655528	239.7659398	0	0.665954131
14.9	120.8112159	53.69541299	238.7694931	0	0.662957859
15	122.3061428	53.93316793	237.7776468	0	0.659975294
15.1	123.807491	54.16988197	236.7901417	0	0.657005665
15.2	125.3155677	54.40550523	235.8071864	0	0.654049588
15.3	126.8299838	54.64010072	234.8285187	0	0.651106282

1.12

00012868

3562

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls



00012869

15.4	128.3511274	54.87360545	233.8544014	0	0.648176531
15.5	129.8784561	55.10610729	232.8844228	0	0.645259242
15.6	131.4125791	55.3375073	231.9189918	0	0.64235542
15.7	132.9526667	55.56793997	230.9575954	0	0.639463563
15.8	134.4996779	55.79724967	230.0008842	0	0.636585659
15.9	136.0525095	56.02561525	229.0481226	0	0.633719488
16	137.6121769	56.25287199	228.1000709	0	0.63086722
16.1	139.1777815	56.47916565	227.1560368	0	0.628027063
16.2	140.7498286	56.70441417	226.2163628	0	0.62519989
16.3	142.3281054	56.92865203	225.2809049	0	0.622385272
16.4	143.9123847	57.15191601	224.3495085	0	0.619582751
16.5	145.5032311	57.37411445	223.4225566	0	0.616793461
16.6	147.0998362	57.59537843	222.4995029	0	0.614015779
16.7	148.7029086	57.8155929	221.5808275	0	0.611251134
16.8	150.3119481	58.03483898	220.6661917	0	0.608498518
16.9	151.9268888	58.2531273	219.75555	0	0.605757796
17	153.548255	58.47037267	218.8492592	0	0.603030028
17.1	155.1753188	58.6866932	217.9468266	0	0.600313748
17.2	156.8085077	58.90201942	217.0485419	0	0.597609819
17.3	158.4477537	59.11636231	216.154359	0	0.594918105
17.4	160.0926603	59.32978617	215.2640095	0	0.592237805
17.5	161.7437763	59.54220185	214.377866	0	0.58957003
17.6	163.4007158	59.75367192	213.4956672	0	0.586914001
17.7	165.0632734	59.96422967	212.6172744	0	0.584269306
17.8	166.732001	60.17378544	211.7430607	0	0.581637057
17.9	168.4064387	60.38241384	210.8727155	0	0.579016328
18	170.0864474	60.59013738	210.0061452	0	0.576406841
18.1	171.772477	60.79688295	209.1436547	0	0.573809504
18.2	173.4642104	61.00270199	208.3234764	0	0.571223678
18.3	175.1614648	61.20769788	207.6842078	0	0.568957763
18.4	176.8644989	61.41199962	207.0821226	0	0.567119888
18.5	178.5733391	61.6156257	206.4820286	0	0.565287928
18.6	180.2876648	61.81861337	205.883816	0	0.563461558
18.7	182.0074718	62.02096306	205.2939055	0	0.561640907
18.8	183.733255	62.22263938	204.761341	0	0.55991999
18.9	185.4645036	62.42374242	204.2302904	0	0.55828944
19	187.2011998	62.62427398	203.7007488	0	0.556663364
19.1	188.9434424	62.82422365	203.1727438	0	0.555041845
19.2	190.6914736	63.02356596	202.6463429	0	0.553425082
19.3	192.4449185	63.22234015	202.1214427	0	0.551812771
19.4	194.2037718	63.42054676	201.5980414	0	0.550204908
19.5	195.9680834	63.61818045	201.076153	0	0.548601533
19.6	197.7381339	63.81521171	200.5558554	0	0.54700288
19.7	199.5135559	64.01167906	200.0370469	0	0.545408646
19.8	201.2943423	64.20758316	199.5197261	0	0.543818828
19.9	203.0804859	64.40292473	199.0038907	0	0.54223342
20	204.8721933	64.59768201	198.4895983	0	0.540652594
20.1	206.6693622	64.79186567	197.9768207	0	0.539076266
20.2	208.4718481	64.98549081	197.4655089	0	0.537504319
20.3	210.2796426	65.17855826	196.9556074	0	0.535936653
20.4	212.0927367	65.37106883	196.4471613	0	0.534373197
20.5	213.9112637	65.56300846	195.9402231	0	0.532814223
20.6	215.7352076	65.75437876	195.4347886	0	0.531259718
20.7	217.5644086	65.94519644	194.9308136	0	0.52970955
20.8	219.3988571	66.13546246	194.4281111	0	0.528163566

3563

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012870

20.9	221.2385429	66.32517763	193.9267897	0	0.526621328
21	223.0834555	66.51434294	193.4269213	0	0.525083387
21.1	224.9336853	66.70294882	192.9285312	0	0.523549844
21.2	226.7892364	66.89099479	192.4316207	0	0.522020702
21.3	228.6499698	67.07849542	191.9362896	0	0.520495891
21.4	230.5158744	67.26545203	191.4425873	0	0.518976115
21.5	232.3869388	67.45186589	190.9503184	0	0.517460763
21.6	234.2631515	67.63773815	190.4594796	0	0.515949667
21.7	236.1445008	67.82306998	189.970068	0	0.51444282
21.8	238.0309747	68.0078626	189.4820803	0	0.512940212
21.9	239.9226713	68.19210562	188.9955441	0	0.511441927
22	241.8195027	68.37580824	188.510435	0	0.509947893
22.1	243.7214123	68.55897635	188.0267374	0	0.508458063
22.2	245.6283876	68.74161122	187.5444479	0	0.506972428
22.3	247.5404163	68.92371409	187.0635633	0	0.50549098
22.4	249.4574855	69.10528623	186.5839502	0	0.504013607
22.5	251.3795826	69.28632878	186.105642	0	0.502539918
22.6	253.3066947	69.46684298	185.6287297	0	0.501070327
22.7	255.2388086	69.64683016	185.1532098	0	0.499604887
22.8	257.1759111	69.82629164	184.6790787	0	0.498143589
22.9	259.1179891	70.00522878	184.2061255	0	0.496686424
23	261.0650291	70.18364187	183.731226	0	0.495227939
23.1	263.0170176	70.3615296	183.2576244	0	0.493768496
23.2	264.9739743	70.53888978	182.7854274	0	0.492313245
23.3	266.9358669	70.71572579	182.3146259	0	0.490862159
23.4	268.9026598	70.89204135	181.84521	0	0.48941521
23.5	270.8743392	71.06783786	181.377176	0	0.487972387
23.6	272.8508913	71.24311676	180.9105202	0	0.48653368
23.7	274.8323024	71.41787944	180.4452388	0	0.485099078
23.8	276.8185584	71.59212735	179.9813278	0	0.48366857
23.9	278.8096455	71.76586192	179.5187836	0	0.482242145
24	280.8055495	71.93908459	179.0576022	0	0.480819793
24.1	282.8062563	72.11179681	178.5977799	0	0.479401503
24.2	284.8117519	72.28400002	178.1393127	0	0.477987264
24.3	286.8220221	72.45569569	177.6821967	0	0.476577064
24.4	288.8370526	72.62688528	177.2264282	0	0.475170894
24.5	290.8568293	72.79757026	176.7720031	0	0.473768741
24.6	292.8813378	72.96775208	176.3189176	0	0.472370595
24.7	294.9105638	73.13743222	175.8671342	0	0.470976406
24.8	296.9444931	73.30661212	175.4166748	0	0.469586122
24.9	298.9831112	73.47529326	174.9675434	0	0.468199811
25	301.0264333	73.64347398	174.5197444	0	0.466817488
25.1	303.074439	73.8111564	174.0732723	0	0.465439137
25.2	305.1270948	73.97834404	173.6281186	0	0.46406473
25.3	307.1843861	74.1450384	173.1843027	0	0.46269429
25.4	309.2462985	74.31124101	172.7418012	0	0.461327827
25.5	311.3128174	74.47695336	172.3006049	0	0.459965273
25.6	313.3839283	74.64217695	171.8607099	0	0.458606618
25.7	315.4596167	74.80691329	171.4221122	0	0.45725185
25.8	317.5398681	74.97116387	170.9848079	0	0.455900958
25.9	319.624668	75.1349302	170.5487998	0	0.45455394
26	321.7140019	75.29821377	170.1140787	0	0.453210791
26.1	323.8078553	75.46101609	169.6806388	0	0.451871484
26.2	325.9062137	75.62333866	169.2484763	0	0.450536007
26.3	328.0090719	75.78518198	168.8175896	0	0.449204357

[Handwritten signature]

[Handwritten mark]

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012871

29.1

26.4	330.116505	75.94653802	168.3880003	0	0.447876599
26.5	332.2284028	76.10741847	167.959677	0	0.44655264
26.6	334.3447508	76.26782482	167.5326158	0	0.445232468
26.7	336.4655345	76.42775859	167.1068129	0	0.443916072
26.8	338.5907395	76.58722125	166.6822642	0	0.442603441
26.9	340.7203513	76.74621431	166.2589657	0	0.441294564
27	342.8543556	76.90473927	165.8369135	0	0.439989428
27.1	344.992738	77.0627976	165.4161036	0	0.438688024
27.2	347.135613	77.22037706	164.9965684	0	0.437390449
27.3	349.2828467	77.37749189	164.5782703	0	0.43609659
27.4	351.4344178	77.5341443	164.1612034	0	0.434806429
27.5	353.590312	77.69033579	163.7453635	0	0.433519957
27.6	355.750515	77.84606783	163.3307469	0	0.432237161
27.7	357.9150125	78.00134191	162.9173495	0	0.43095803
27.8	360.0838668	78.15615136	162.5051889	0	0.429682618
27.9	362.2570671	78.31049728	162.0942625	0	0.428410916
28	364.4345212	78.46438944	161.684544	0	0.427142848
28.1	366.616215	78.61782934	161.2760297	0	0.425878401
28.2	368.8021344	78.77081843	160.8687155	0	0.424617565
28.3	370.9922652	78.92335818	160.4625977	0	0.423360329
28.4	373.1867568	79.07543267	160.0582836	0	0.422107074
28.5	375.3854401	79.22706073	159.6557287	0	0.420860324
28.6	377.5882943	79.37824482	159.2543524	0	0.41961724
28.7	379.7953056	79.5289864	158.854151	0	0.418377694
28.8	382.0064655	79.67928631	158.4551222	0	0.417141678
28.9	384.2219312	79.82912779	158.0573104	0	0.415909328
29	386.4415031	79.9714532	69.01253066	0	0.371001433
29.1	388.6634613	79.98858844	0	0	-0.042342256
29.2	390.88516	79.97334727	0	0	-0.042334309
29.3	393.1064305	79.95810899	0	0	-0.042326365
29.4	395.3272721	79.94287361	0	0	-0.042318424
29.5	397.5476948	79.92764106	0	0	-0.042310485
29.6	399.7676985	79.91241133	0	0	-0.042302548
29.7	401.9872833	79.89718444	0	0	-0.042294615
29.8	404.2064316	79.88196049	0	0	-0.042286684
29.9	406.42516	79.86673938	0	0	-0.042278755
30	408.6434699	79.8515211	0	0	-0.042270829
30.1	410.8613611	79.83630563	0	0	-0.042262906
30.2	413.0788269	79.82109304	0	0	-0.042254986
30.3	415.2958624	79.80588336	0	0	-0.042247068
30.4	417.5124795	79.79067649	0	0	-0.042239152
30.5	419.7286783	79.77547245	0	0	-0.04223124
30.6	421.9444587	79.76027123	0	0	-0.04222333
30.7	424.1598072	79.74507292	0	0	-0.042215422
30.8	426.3747328	79.72987746	0	0	-0.042207517
30.9	428.5892402	79.71468482	0	0	-0.042199615
31	430.8033297	79.699495	0	0	-0.042191715
31.1	433.0169997	79.684308	0	0	-0.042183818
31.2	435.2302349	79.66912394	0	0	-0.042175924
31.3	437.4430522	79.65394269	0	0	-0.042168032
31.4	439.6554518	79.63876425	0	0	-0.042160143
31.5	441.8674337	79.62358863	0	0	-0.042152257
31.6	444.0789911	79.60841587	0	0	-0.042144373
31.7	446.2901196	79.59324599	0	0	-0.042136491
31.8	448.5008305	79.57807893	0	0	-0.042128613

3565

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012872

3

31.9	450.711124	79.56291467	0	0	-0.042120737
32	452.9210001	79.54775323	0	0	-0.042112863
32.1	455.1304476	79.53259467	0	0	-0.042104992
32.2	457.3394711	79.51743896	-90.8877358	0	-0.042097124
32.3	459.5461059	79.28144295	-312.714507	-52.72468015	-0.971654643
32.4	461.7429308	78.88544375	-314.545775	-50.96411814	-1.099997798
32.5	463.9288353	78.48944455	-316.380711	-49.19975066	-1.099997822
32.6	466.1035653	78.09344515	-318.215648	-47.43525072	-1.099998579
32.7	468.2672049	77.69744556	-320.050584	-45.67029511	-1.099998874
32.8	470.4199081	77.30144582	-321.885521	-43.90534049	-1.099999503
32.9	472.5616645	76.90544575	-323.720459	-42.13977961	-1.100000281
33	474.6924644	76.50944574	-325.555395	-40.37396886	-1.09999999
33.1	476.8122986	76.11344564	-327.390331	-38.607945	-1.100000443
33.2	478.9211582	75.71744564	-329.224936	-36.84154649	-1.099999694
33.3	481.0189872	75.32144597	-331.059407	-35.07524752	-1.099998927
33.4	483.1056528	74.9254464	-332.893942	-33.30868538	-1.09999878
33.5	485.1813446	74.52944688	-334.728757	-31.54174292	-1.099998695
33.6	487.2460569	74.13344719	-336.563574	-29.77467432	-1.099999362
33.7	489.2997848	73.7374474	-338.398486	-28.00678687	-1.099999206
33.8	491.342524	73.34144776	-340.233446	-26.23885318	-1.099998975
33.9	493.3742712	72.94544806	-342.068405	-24.47048371	-1.099999179
34	495.3950238	72.54944854	-343.903361	-22.70186256	-1.099998546
34.1	497.40478	72.15344906	-345.738317	-20.93317572	-1.099998625
34.2	499.4035392	71.75744951	-347.573271	-19.16417446	-1.099998756
34.3	501.3913015	71.36144985	-349.408224	-17.39515374	-1.099999204
34.4	503.3680681	70.96544989	-351.243178	-15.62565011	-1.100000007
34.5	505.3338414	70.56944993	-353.078129	-13.85582024	-1.099999857
34.6	507.288625	70.17344988	-354.913081	-12.08586584	-1.100000268
34.7	509.2324235	69.77744984	-356.998006	-10.06512765	-1.099999846
34.8	511.1652429	69.38145015	-359.277753	-7.849518844	-1.099998945
34.9	513.0870907	68.98545059	-361.558461	-5.632795452	-1.099998778
35	514.9979695	68.58945109	-363.864409	-3.390711515	-1.099998625
35.1	516.8975946	68.19345143	-366.170359	-1.148551314	-1.099999255
35.2	518.7862375	67.79745162	-367.381906	0	-1.099999309
35.3	520.6639105	67.40145201	-367.444863	0	-1.099998847
35.4	522.5306274	67.0054524	-367.507491	0	-1.099998923
35.5	524.3864042	66.60945292	-367.569817	0	-1.099998424
35.6	526.2312584	66.2134535	-367.632102	0	-1.099998435
35.7	528.0652099	65.81745399	-367.694026	0	-1.099998616
35.8	529.8879078	65.42145443	-367.755911	0	-1.09999889
35.9	531.6994819	65.02545458	-367.817399	0	-1.099999778
36	533.5001718	64.62945471	-367.878473	0	-1.099999565
36.1	535.2900048	64.23345482	-367.939448	0	-1.099999795
36.2	537.069011	63.83745487	-367.999723	0	-1.099999685
36.3	538.8366448	63.44145526	-368.059873	0	-1.099998794
36.4	540.5932165	63.04545575	-368.11989	0	-1.099998619
36.5	542.3390042	62.64945627	-368.179748	0	-1.099998562
36.6	544.0740478	62.25345665	-368.239573	0	-1.099999102
36.7	545.797637	61.85745683	-368.298555	0	-1.099999376
36.8	547.5102282	61.46145725	-368.357446	0	-1.099998744
36.9	549.2121422	61.06545772	-368.416095	0	-1.099998696
37	550.9030561	60.6694583	-368.474416	0	-1.099998249
37.1	552.582511	60.27345895	-368.532694	0	-1.099998226
37.2	554.2513757	59.87745951	-368.59062	0	-1.099998512
37.3	555.9093479	59.48146004	-368.64846	0	-1.09999859

3566

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls



00012873

37.4	557.5557723	59.08546031	-368.705981	0	-1.099999407
37.5	559.1917175	58.68946053	-368.763009	0	-1.099999259
37.6	560.8164883	58.2934608	-368.820039	0	-1.099999317
37.7	562.4300431	57.89746095	-368.876309	0	-1.0999995
37.8	564.0332578	57.5014614	-368.932475	0	-1.099998576
37.9	565.6245782	57.10546196	-368.988524	0	-1.099998475
38	567.2054902	56.70946252	-369.044382	0	-1.099998434
38.1	568.7752252	56.31346295	-369.100238	0	-1.099998934
38.2	570.333871	55.91746308	-369.155434	0	-1.099999733
38.3	571.8819016	55.52146325	-369.210515	0	-1.099999518
38.4	573.4183333	55.12546327	-369.265324	0	-1.100000045
38.5	574.9445432	54.72946327	-369.319595	0	-1.099999807
38.6	576.4588304	54.33346342	-369.37381	0	-1.099999598
38.7	577.9631064	53.93746352	-369.427577	0	-1.099999744
38.8	579.455339	53.54146382	-369.481167	0	-1.099999137
38.9	580.9375718	53.14546413	-369.534581	0	-1.099999196
39	582.4078625	52.74946444	-369.587643	0	-1.099999101
39.1	583.8679477	52.35346477	-369.640698	0	-1.099999147
39.2	585.3164353	51.95746489	-369.693319	0	-1.099999717
39.3	586.7542749	51.56146495	-369.745833	0	-1.099999871
39.4	588.1811282	51.16546478	-369.798063	0	-1.100000592
39.5	589.5966315	50.76946452	-369.849085	-0.000499193	-1.100000601
39.6	591.0020534	50.37346448	-369.849107	-0.05199981	-1.100000032
39.7	592.3951392	49.97746446	-369.849012	-0.103197763	-1.100000022
39.8	593.778086	49.58146456	-369.846959	-0.156231858	-1.099999668
39.9	595.1499708	49.18546464	-369.844905	-0.209069394	-1.099999822
40	596.5103626	48.78946471	-369.843994	-0.260212351	-1.099999727
40.1	597.86051	48.39346495	-369.844088	-0.310352611	-1.099999281
40.2	599.1991414	47.99746517	-369.844182	-0.359992101	-1.099999941
40.3	600.5266156	47.60146557	-369.844284	-0.409463013	-1.099998852
40.4	601.8437426	47.20546601	-369.844385	-0.458769999	-1.09999988
40.5	603.1495099	46.80946644	-369.844484	-0.507739356	-1.09999879
40.6	604.443871	46.41346689	-369.84458	-0.556639261	-1.099998767
40.7	605.7277866	46.01746718	-369.844677	-0.605209426	-1.099999277
40.8	607.0012102	45.62146741	-369.844789	-0.65357454	-1.099999364
40.9	608.2623008	45.22546741	-369.844903	-0.701728984	-1.100000031
41	609.5128544	44.82946728	-369.844939	-0.749237975	-1.10000003
41.1	610.752834	44.43346735	-369.844875	-0.796852069	-1.099999976
41.2	611.9822025	44.03746738	-369.84481	-0.844043933	-1.099999963
41.3	613.1994291	43.64146756	-369.844861	-0.89096076	-1.099999484
41.4	614.4058719	43.24546772	-369.844925	-0.937644846	-1.09999996
41.5	615.6016263	42.84946788	-369.844986	-0.983838859	-1.099999506
41.6	616.7866575	42.45346822	-369.845043	-1.029983533	-1.099999002
41.7	617.9609311	42.05746854	-369.845101	-1.075669241	-1.099999142
41.8	619.1233973	41.66146907	-369.845178	-1.121155618	-1.099998516
41.9	620.2747701	41.26546965	-369.845259	-1.16651455	-1.099998397
42	621.4153326	40.86947019	-369.84534	-1.211472562	-1.099998486
42.1	622.5450553	40.47347078	-369.845419	-1.256388199	-1.099998352
42.2	623.6639092	40.07747122	-369.845499	-1.300963529	-1.099998829
42.3	624.7718665	39.6814716	-369.845648	-1.345263804	-1.099998948
42.4	625.8689002	39.28547183	-369.845814	-1.389308739	-1.099999385
42.5	626.954985	38.88947191	-369.845927	-1.43284296	-1.099999816
42.6	628.0298086	38.49347213	-369.845901	-1.476440797	-1.099999351
42.7	629.0932933	38.09747231	-369.845875	-1.519626785	-1.09999951
42.8	630.145846	37.70147257	-369.845915	-1.562546664	-1.099999277

3567

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012874

42.9	631.1874532	37.30547284	-369.845977	-1.605296609	-1.099999256
43	632.2181039	36.90947302	-369.846049	-1.647398153	-1.099999494
43.1	633.2377902	36.51347348	-369.846153	-1.689404971	-1.099998726
43.2	634.2465072	36.11747401	-369.846257	-1.731112554	-1.099998524
43.3	635.2442539	35.72147465	-369.846392	-1.772537348	-1.099998227
43.4	636.2310331	35.32547538	-369.846539	-1.813830623	-1.099997961
43.5	637.2068523	34.92947605	-369.845853	-1.855555594	-1.099998139
43.6	638.1717237	34.53347681	-369.841321	-1.901057797	-1.099997887
43.7	639.1256656	34.13747745	-369.836789	-1.946255742	-1.099998229
43.8	640.0687022	33.74147801	-369.835379	-1.988085906	-1.099998451
43.9	641.0008648	33.34547847	-369.83563	-2.028112082	-1.099998701
44	641.9211621	32.9494787	-369.836621	-2.066743882	-1.099999322
44.1	642.8304583	32.55347908	-369.842675	-2.100320616	-1.099998985
44.2	643.7288065	32.15747933	-369.848728	-2.133401874	-1.099999253
44.3	644.6162582	31.76147969	-369.851149	-2.169967671	-1.099999055
44.4	645.4928756	31.36548004	-369.851173	-2.208592363	-1.099998991
44.5	646.3587335	30.96948045	-369.851196	-2.246871188	-1.099998917
44.6	647.2139201	30.57348101	-369.851219	-2.28492971	-1.099998845
44.7	648.0585396	30.17748168	-369.851242	-2.322716941	-1.099998142
44.8	648.8909694	29.7814825	-369.851265	-2.36026745	-1.099997763
44.9	649.7118223	29.3854834	-369.851288	-2.397588748	-1.099997541
45	650.5221526	28.98948432	-369.85131	-2.434704114	-1.099997451
45.1	651.3221152	28.59348522	-369.851332	-2.471602626	-1.099997494
45.2	652.1118908	28.19748606	-369.851354	-2.508276115	-1.099997656
45.3	652.8896653	27.80148681	-369.851376	-2.544688974	-1.099997888
45.4	653.6551898	27.40548742	-369.851398	-2.580717581	-1.099998204
45.5	654.4107117	27.009488	-369.85142	-2.616500407	-1.099998376
45.6	655.1565012	26.61348857	-369.851441	-2.652039516	-1.099998428
45.7	655.8906178	26.21748909	-369.851462	-2.687231459	-1.099998526
45.8	656.6118487	25.82148968	-369.851483	-2.722280228	-1.099998427
45.9	657.3237064	25.42549017	-369.851504	-2.757060201	-1.099998552
46	658.0266017	25.02949054	-369.851525	-2.791546664	-1.099998964
46.1	658.714293	24.63349092	-369.851545	-2.825851832	-1.099998952
46.2	659.3925216	24.23749113	-369.851566	-2.85980234	-1.099999262
46.3	660.062443	23.84149122	-369.851586	-2.893458639	-1.099999742
46.4	660.7173574	23.44549135	-369.851606	-2.926713986	-1.099999674
46.5	661.3625971	23.04949154	-369.851626	-2.959772585	-1.099999539
46.6	662.0004779	22.65349177	-369.851646	-2.992681644	-1.099999355
46.7	662.6208848	22.257492	-369.851665	-3.024902863	-1.099999357
46.8	663.2342931	21.86149241	-369.851685	-3.057025574	-1.099999069
46.9	663.836705	21.46549308	-369.851704	-3.088993553	-1.099998328
47	664.4255952	21.06949386	-369.851723	-3.120754736	-1.09999796
47.1	665.0091468	20.67349467	-369.851742	-3.152430356	-1.099997739
47.2	665.5738491	20.27749533	-369.85176	-3.18355866	-1.099997976
47.3	666.1336851	19.881496	-369.851779	-3.214590918	-1.099998149
47.4	666.6785536	19.48549668	-369.851797	-3.245327665	-1.099998128
47.5	667.2149814	19.08949729	-369.851816	-3.275868933	-1.099998208
47.6	667.7392653	18.69349782	-369.851833	-3.306129296	-1.099998434
47.7	668.2527776	18.29749824	-369.851851	-3.336092953	-1.099998691
47.8	668.7556334	17.90149856	-369.851869	-3.365763086	-1.099998977
47.9	669.2469826	17.50549884	-369.851886	-3.395084797	-1.099999162
48	669.7274539	17.10949909	-369.851904	-3.424076801	-1.099999251
48.1	670.197763	16.71349944	-369.851921	-3.452842654	-1.099999178
48.2	670.6547519	16.31749992	-369.851938	-3.481311757	-1.099998892
48.3	671.1056866	15.92150043	-369.851955	-3.509692226	-1.099998637

|

S

b

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012875

48.4	671.5379154	15.52550104	-369.851971	-3.537798937	-1.099998477
48.5	671.9701442	15.12950165	-369.851988	-3.565905648	-1.099998318
48.6	672.3779149	14.73350185	-369.852004	-3.593092692	-1.09999876
48.7	672.7838707	14.33750203	-369.85202	-3.620211642	-1.099999247
48.8	673.1766849	13.94150242	-369.852035	-3.647140067	-1.099999289
48.9	673.5545366	13.54550304	-369.852051	-3.673851961	-1.099998824
49	673.9323882	13.14950366	-369.852066	-3.700563855	-1.099998359
49.1	674.285292	12.75350405	-369.852081	-3.726552809	-1.099998497
49.2	674.6327589	12.35750439	-369.852096	-3.752384366	-1.099998766
49.3	674.9802257	11.96150473	-369.85211	-3.778215996	-1.099999035
49.4	675.2962523	11.5655052	-369.852124	-3.803306178	-1.099998942
49.5	675.6103816	11.16950567	-369.852138	-3.828351579	-1.099998828
49.6	675.9245109	10.77350614	-369.852152	-3.853397487	-1.099998714
49.7	676.2102413	10.37750667	-369.852165	-3.877628323	-1.099998642
49.8	676.4869882	9.981507222	-368.513104	-5.240675231	-1.099998585
49.9	676.7637351	9.585507769	-339.838541	-33.93922399	-1.099998527
50	677.0341264	9.189508422	-311.163986	-62.63706647	-1.09999841
50.1	677.2674247	8.793509686	-282.150211	-91.67005105	-1.099997946
50.2	677.500723	8.397510949	-252.825073	-121.0143984	-1.099997483
50.3	677.7340213	8.001512213	-223.499935	-150.3587458	-1.099997019
50.4	677.9673195	7.605513476	-194.174791	-179.7030997	-1.099996555
50.5	678.1539242	7.209529774	-164.85076	-209.0113091	-1.099989015
50.6	678.3329225	6.813548521	-135.526907	-238.3136337	-1.099980322
50.7	678.5119208	6.417567269	-106.20305	-267.615962	-1.099971628
50.8	678.690919	6.021586016	-76.8791935	-296.9182902	-1.099962935
50.9	678.8699173	5.625604763	-47.55533	-326.2206254	-1.099954242
51	679.0202596	5.229692465	-18.2365725	-355.5237378	-1.099933725
51.1	679.0943962	4.833963541	-1.02327457	-372.7370357	-1.099881761
51.2	679.1685328	4.438234617	-0.53771069	-373.2225996	-1.099829798
51.3	679.2426694	4.042505692	-0.0521468	-373.7081635	-1.099777835
51.4	679.316806	3.646776768	2.92506E-05	-373.7603395	-1.099725871
51.5	679.3909426	3.251047844	5.2875E-05	-373.7603631	-1.099673908
51.6	679.4650792	2.85531892	8.53733E-05	-373.7603956	-1.099621945
51.7	679.5392158	2.459589996	0.000133269	-373.7604435	-1.099569981
51.8	679.6133524	2.063861072	0.000181166	-373.7604914	-1.099518018
51.9	679.687489	1.668132148	0.000310088	-373.7606204	-1.099466055
52	679.7616256	1.272403224	0.000454602	-373.7607649	-1.099414091
52.1	679.8357622	0.8766743	0.000485747	-373.760796	-1.099362128
52.2	679.9098988	0.480945375	0.000266482	-373.7605768	-1.099310165
52.3	679.9840354	0.085216451	4.72167E-05	-373.7603575	-1.099258201
52.4	680.000001	0	0	0	0
52.5	680.000001	0	0	0	0
52.6	680.000001	0	0	0	0
52.7	680.000001	0	0	0	0
52.8	680.000001	0	0	0	0
52.9	680.000001	0	0	0	0
53	680.000001	0	0	0	0
53.1	680.000001	0	0	0	0
53.2	680.000001	0	0	0	0
53.3	680.000001	0	0	0	0
53.4	680.000001	0	0	0	0
53.5	680.000001	0	0	0	0
53.6	680.000001	0	0	0	0
53.7	680.000001	0	0	0	0
53.8	680.000001	0	0	0	0

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012876

53.9	680.000001	0	0	0	0
54	680.000001	0	0	0	0
54.1	680.000001	0	0	0	0
54.2	680.000001	0	0	0	0
54.3	680.000001	0	0	0	0
54.4	680.000001	0	0	0	0
54.5	680.000001	0	0	0	0
54.6	680.000001	0	0	0	0
54.7	680.000001	0	0	0	0
54.8	680.000001	0	0	0	0
54.9	680.000001	0	0	0	0
55	680.000001	0	0	0	0
55.1	680.000001	0	0	0	0
55.2	680.000001	0	0	0	0
55.3	680.000001	0	0	0	0
55.4	680.000001	0	0	0	0
55.5	680.000001	0	0	0	0
55.6	680.000001	0	0	0	0
55.7	680.000001	0	0	0	0
55.8	680.000001	0	0	0	0
55.9	680.000001	0	0	0	0
56	680.000001	0	0	0	0
56.1	680.000001	0	0	0	0
56.2	680.000001	0	0	0	0
56.3	680.000001	0	0	0	0
56.4	680.000001	0	0	0	0
56.5	680.000001	0	0	0	0
56.6	680.000001	0	0	0	0
56.7	680.000001	0	0	0	0
56.8	680.000001	0	0	0	0
56.9	680.000001	0	0	0	0
57	680.000001	0	0	0	0
57.1	680.000001	0	0	0	0
57.2	680.000001	0	0	0	0
57.3	680.000001	0	0	0	0
57.4	680.000001	0	0	0	0
57.5	680.000001	0	0	0	0
57.6	680.000001	0	0	0	0
57.7	680.000001	0	0	0	0
57.8	680.000001	0	0	0	0
57.9	680.000001	0	0	0	0
58	680.000001	0	0	0	0
58.1	680.000001	0	0	0	0
58.2	680.000001	0	0	0	0
58.3	680.000001	0	0	0	0
58.4	680.000001	0	0	0	0
58.5	680.000001	0	0	0	0
58.6	680.000001	0	0	0	0
58.7	680.000001	0	0	0	0
58.8	680.000001	0	0	0	0
58.9	680.000001	0	0	0	0
59	680.000001	0	0	0	0
59.1	680.000001	0	0	0	0
59.2	680.000001	0	0	0	0
59.3	680.000001	0	0	0	0

3577

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012377

59.4	680.000001	0	0	0	0
59.5	680.000001	0	0	0	0
59.6	680.000001	0	0	0	0
59.7	680.000001	0	0	0	0
59.8	680.000001	0	0	0	0
59.9	680.000001	0	0	0	0
60	680.000001	0	0	0	0
60.1	680.000001	0	0	0	0
60.2	680.000001	0	0	0	0
60.3	680.000001	0	0	0	0
60.4	680.000001	0	0	0	0
60.5	680.000001	0	0	0	0
60.6	680.000001	0	0	0	0
60.7	680.000001	0	0	0	0
60.8	680.000001	0	0	0	0
60.9	680.000001	0	0	0	0
61	680.000001	0	0	0	0
61.1	680.000001	0	0	0	0
61.2	680.000001	0	0	0	0
61.3	680.000001	0	0	0	0
61.4	680.000001	0	0	0	0
61.5	680.000001	0	0	0	0
61.6	680.000001	0	0	0	0
61.7	680.000001	0	0	0	0
61.8	680.000001	0	0	0	0
61.9	680.000001	0	0	0	0
62	680.000001	0	0	0	0
62.1	680.000001	0	0	0	0
62.2	680.000001	0	0	0	0
62.3	680.000001	0	0	0	0
62.4	680.000001	0	0	0	0
62.5	680.000001	0	0	0	0
62.6	680.000001	0	0	0	0
62.7	680.000001	0	0	0	0
62.8	680.000001	0	0	0	0
62.9	680.000001	0	0	0	0
63	680.000001	0	0	0	0
63.1	680.000001	0	0	0	0
63.2	680.000001	0	0	0	0
63.3	680.000001	0	0	0	0
63.4	680.000001	0	0	0	0
63.5	680.000001	0	0	0	0
63.6	680.000001	0	0	0	0
63.7	680.000001	0	0	0	0
63.8	680.000001	0	0	0	0
63.9	680.000001	0	0	0	0
64	680.000001	0	0	0	0
64.1	680.000001	0	0	0	0
64.2	680.000001	0	0	0	0
64.3	680.000001	0	0	0	0
64.4	680.000001	0	0	0	0
64.5	680.000001	0	0	0	0
64.6	680.000001	0	0	0	0
64.7	680.000001	0	0	0	0
64.8	680.000001	0	0	0	0

3571

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

64.9	680.000001	0	0	0	0
65	680.000001	0	0	0	0
65.1	680.000001	0	0	0	0
65.2	680.000001	0	0	0	0
65.3	680.000001	0	0	0	0
65.4	680.000001	0	0	0	0
65.5	680.000001	0	0	0	0
65.6	680.000001	0	0	0	0
65.7	680.000001	0	0	0	0
65.8	680.000001	0	0	0	0
65.9	680.000001	0	0	0	0
66	680.000001	0	0	0	0
66.1	680.000001	0	0	0	0
66.2	680.000001	0	0	0	0
66.3	680.000001	0	0	0	0
66.4	680.000001	0	0	0	0
66.5	680.000001	0	0	0	0
66.6	680.000001	0	0	0	0
66.7	680.000001	0	0	0	0
66.8	680.000001	0	0	0	0
66.9	680.000001	0	0	0	0
67	680.000001	0	0	0	0
67.1	680.000001	0	0	0	0
67.2	680.000001	0	0	0	0
67.3	680.000001	0	0	0	0
67.4	680.000001	0	0	0	0
67.5	680.000001	0	0	0	0
67.6	680.000001	0	0	0	0
67.7	680.000001	0	0	0	0
67.8	680.000001	0	0	0	0
67.9	680.000001	0	0	0	0
68	680.000001	0	0	0	0
68.1	680.000001	0	0	0	0
68.2	680.000001	0	0	0	0
68.3	680.000001	0	0	0	0
68.4	680.000001	0	0	0	0
68.5	680.000001	0	0	0	0
68.6	680.000001	0	0	0	0
68.7	680.000001	0	0	0	0
68.8	680.000001	0	0	0	0
68.9	680.000001	0	0	0	0
69	680.000001	0	0	0	0
69.1	680.000001	0	0	0	0
69.2	680.000001	0	0	0	0
69.3	680.000001	0	0	0	0
69.4	680.000001	0	0	0	0

00012878



3572

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

Cycle A2

7C 5M AW2 6p/m²

00012879

Average acceleration from 0 to 40Km/h	1.04 m/s ²
Time from 0 to 80Km/h	31.3 s
Coastin time	0 s
Stop Time	17.0 s
Cycle time	51.9 s
Total Distance	650 m

time(s)	distance(m)	speed(km/h)	F_elec(kN)	F_brakeP(kN)	gamma(m/s2)
0	0	0	397.182	0	1.05443
0.1	7.26E-02	0.379596	397.182	0	1.05E+00
0.2	0.145219	0.759192	397.182	0	1.05443
0.3	0.217829	1.13879	397.182	0	1.05443
0.4	0.290439	1.51838	397.182	0	1.05443
0.5	0.363048	1.89798	397.182	0	1.05443
0.6	0.435658	2.27757	397.182	0	1.05443
0.7	0.508268	2.65717	397.182	0	1.05443
0.8	0.580877	3.03677	397.182	0	1.05443
0.9	0.653487	3.41636	397.182	0	1.05443
1	0.726097	3.79596	397.182	0	1.05443
1.1	0.798706	4.17555	397.182	0	1.05443
1.2	0.871316	4.55515	397.182	0	1.05443
1.3	0.943926	4.93475	397.182	0	1.05443
1.4	1.03992	5.31428	397.181	0	1.0544
1.5	1.21519	5.69361	397.181	0	1.05427
1.6	1.39047	6.07294	397.181	0	1.05415
1.7	1.56575	6.45227	397.181	0	1.05402
1.8	1.74103	6.83161	397.181	0	1.05389
1.9	1.9163	7.21094	397.181	0	1.05376
2	2.11933	7.5902	397.181	0	1.05366
2.1	2.34773	7.96941	397.181	0	1.05358
2.2	2.57612	8.34862	397.181	0	1.0535
2.3	2.80452	8.72783	397.181	0	1.05342
2.4	3.03904	9.10702	397.181	0	1.05335
2.5	3.30993	9.48613	397.181	0	1.05327
2.6	3.58082	9.86524	397.181	0	1.0532
2.7	3.85172	10.2444	397.181	0	1.05312
2.8	4.13916	10.6234	397.181	0	1.05305
2.9	4.44661	11.0024	397.181	0	1.05297
3	4.75406	11.3815	397.181	0	1.0529
3.1	5.06803	11.7605	397.181	0	1.05282
3.2	5.40808	12.1394	397.181	0	1.05275
3.3	5.74814	12.5184	397.181	0	1.05267
3.4	6.09589	12.8973	397.181	0	1.0526
3.5	6.46565	13.2761	397.181	0	1.05252
3.6	6.83541	13.655	397.181	0	1.05244
3.7	7.22041	14.0338	397.181	0	1.05237
3.8	7.61765	14.4126	397.181	0	1.05229
3.9	8.01585	14.7914	397.181	0	1.05221
4	8.43876	15.1702	397.181	0	1.05214
4.1	8.86168	15.5489	397.181	0	1.05206
4.2	9.30088	15.9276	397.181	0	1.05198
4.3	9.748	16.3063	397.181	0	1.0519

3573

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012880

4.4	10.2051	16.6849	397.181	0	1.05182
4.5	10.6752	17.0635	397.181	0	1.05174
4.6	11.152	17.4421	397.181	0	1.05166
4.7	11.644	17.8206	397.181	0	1.05158
4.8	12.1417	18.1992	397.181	0	1.05149
4.9	12.6546	18.5776	397.181	0	1.05141
5	13.174	18.9561	397.181	0	1.05133
5.1	13.707	19.3345	397.181	0	1.05124
5.2	14.2487	19.713	397.181	0	1.05116
5.3	14.8011	20.0913	397.181	0	1.05107
5.4	15.3654	20.4697	397.181	0	1.05099
5.5	15.9365	20.848	397.181	0	1.0509
5.6	16.5237	21.2263	397.181	0	1.05082
5.7	17.1162	21.6045	397.181	0	1.05073
5.8	17.723	21.9827	397.181	0	1.05064
5.9	18.3391	22.3609	397.181	0	1.05055
6	18.9629	22.7391	397.181	0	1.05046
6.1	19.6024	23.1172	397.181	0	1.05037
6.2	20.249	23.4953	397.181	0	1.05028
6.3	20.9056	23.8734	397.181	0	1.05019
6.4	21.5758	24.2514	397.181	0	1.0501
6.5	22.254	24.6294	397.181	0	1.05001
6.6	22.9419	25.0074	397.181	0	1.04992
6.7	23.6436	25.3853	397.187	0	1.04982
6.8	24.3539	25.7632	397.193	0	1.04974
6.9	25.0732	26.1411	397.198	0	1.04966
7	25.8054	26.5189	397.198	0	1.04958
7.1	26.5481	26.8967	397.198	0	1.04949
7.2	27.3	27.2745	397.197	0	1.04939
7.3	28.0615	27.6522	397.194	0	1.0493
7.4	28.8356	28.0299	397.191	0	1.04919
7.5	29.6202	28.4076	397.191	0	1.04908
7.6	30.4146	28.7852	397.191	0	1.04898
7.7	31.2188	29.1628	397.192	0	1.04888
7.8	32.033	29.5404	397.192	0	1.04879
7.9	32.8595	29.9179	397.192	0	1.04868
8	33.6964	30.2954	397.192	0	1.04858
8.1	34.5434	30.6728	397.193	0	1.04848
8.2	35.4006	31.0503	397.193	0	1.04838
8.3	36.268	31.4276	397.191	0	1.04828
8.4	37.1457	31.805	397.189	0	1.04817
8.5	38.0338	32.1823	397.188	0	1.04806
8.6	38.9332	32.5595	397.188	0	1.04795
8.7	39.8433	32.9368	397.188	0	1.04785
8.8	40.7637	33.3139	397.188	0	1.04774
8.9	41.6945	33.6911	397.188	0	1.04763
9	42.6357	34.0682	396.234	0	1.04753
9.1	43.5873	34.4444	394.064	0	1.04504
9.2	44.5492	34.8184	391.433	0	1.03917
9.3	45.5216	35.1899	387.742	0	1.0319
9.4	46.5041	35.5577	383.125	0	1.02186
9.5	47.4969	35.921	378.545	0	1.00919
9.6	48.4996	36.2798	374.021	0	0.996612
9.7	49.5123	36.6342	369.554	0	0.9842
9.8	50.5348	36.9841	365.142	0	0.971946

Handwritten signature

Handwritten mark

3574

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012881

9.9	51.5669	37.3297	360.784	0	0.959848
10	52.6085	37.6711	356.48	0	0.947904
10.1	53.6595	38.0082	352.23	0	0.936111
10.2	54.7198	38.3412	348.032	0	0.924468
10.3	55.7893	38.6701	343.885	0	0.912971
10.4	56.8677	38.9949	339.79	0	0.901619
10.5	57.9551	39.3157	335.745	0	0.890409
10.6	59.0516	39.6325	331.752	0	0.879347
10.7	60.1572	39.9452	327.81	0	0.868428
10.8	61.2713	40.254	323.916	0	0.857646
10.9	62.3938	40.5591	320.07	0	0.846999
11	63.5247	40.8604	316.27	0	0.836484
11.1	64.6637	41.1581	313.036	0	0.8261
11.2	65.8109	41.4527	310.246	0	0.817552
11.3	66.966	41.7446	307.496	0	0.80992
11.4	68.1298	42.0335	304.894	0	0.80239
11.5	69.3017	42.32	303.218	0	0.795655
11.6	70.4813	42.6049	301.552	0	0.791026
11.7	71.6686	42.8882	299.896	0	0.786423
11.8	72.8636	43.1698	298.249	0	0.781846
11.9	74.0665	43.4498	296.611	0	0.777297
12	75.2776	43.7281	294.984	0	0.772776
12.1	76.4963	44.0048	293.366	0	0.768281
12.2	77.7223	44.2799	291.757	0	0.763811
12.3	78.9557	44.5535	290.157	0	0.759366
12.4	80.1974	44.8254	288.567	0	0.754949
12.5	81.4465	45.0957	286.986	0	0.750559
12.6	82.7028	45.3645	285.414	0	0.746192
12.7	83.9662	45.6319	283.85	0	0.74185
12.8	85.2378	45.8975	282.297	0	0.737536
12.9	86.5165	46.1616	280.752	0	0.733246
13	87.8023	46.4242	279.216	0	0.72898
13.1	89.0953	46.6853	277.689	0	0.724739
13.2	90.396	46.9448	276.172	0	0.720525
13.3	91.7036	47.2029	274.663	0	0.716334
13.4	93.0179	47.4595	273.162	0	0.712166
13.5	94.3402	47.7145	271.671	0	0.708026
13.6	95.6691	47.9681	270.188	0	0.703908
13.7	97.0046	48.2203	268.713	0	0.699812
13.8	98.348	48.4709	267.247	0	0.695743
13.9	99.6979	48.7201	265.79	0	0.691696
14	101.054	48.9679	264.341	0	0.687672
14.1	102.418	49.2141	262.901	0	0.683674
14.2	103.789	49.4591	261.468	0	0.679697
14.3	105.166	49.7025	260.044	0	0.675744
14.4	106.55	49.9445	258.629	0	0.671814
14.5	107.94	50.1853	257.221	0	0.667905
14.6	109.338	50.4244	255.823	0	0.664022
14.7	110.742	50.6623	254.432	0	0.660159
14.8	112.152	50.8988	253.049	0	0.656319
14.9	113.57	51.1339	251.674	0	0.652502
15	114.993	51.3677	250.306	0	0.648706
15.1	116.423	51.6	248.948	0	0.644934
15.2	117.86	51.8311	247.597	0	0.641182
15.3	119.303	52.0607	246.309	0	0.637462

1.04

[Handwritten signature]

[Handwritten mark]

3575

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls



00012882

15.4	120.752	52.2892	245.181	0	0.634068
15.5	122.208	52.5165	244.058	0	0.63094
15.6	123.67	52.7427	242.941	0	0.627827
15.7	125.138	52.9678	241.84	0	0.62473
15.8	126.612	53.1918	240.871	0	0.621773
15.9	128.093	53.4148	239.94	0	0.619126
16	129.58	53.6369	239.014	0	0.616532
16.1	131.073	53.8581	238.091	0	0.613949
16.2	132.572	54.0783	237.172	0	0.611377
16.3	134.077	54.2977	236.257	0	0.608815
16.4	135.589	54.5161	235.346	0	0.606264
16.5	137.106	54.7336	234.439	0	0.603723
16.6	138.629	54.9501	233.535	0	0.601193
16.7	140.159	55.1658	232.635	0	0.598674
16.8	141.694	55.3806	231.739	0	0.596164
16.9	143.235	55.5945	230.847	0	0.593665
17	144.782	55.8075	229.958	0	0.591177
17.1	146.336	56.0196	229.073	0	0.588699
17.2	147.895	56.2308	228.192	0	0.58623
17.3	149.46	56.4411	227.315	0	0.583773
17.4	151.03	56.6505	226.441	0	0.581325
17.5	152.607	56.8591	225.571	0	0.578889
17.6	154.189	57.0668	224.705	0	0.576461
17.7	155.777	57.2736	223.842	0	0.574044
17.8	157.371	57.4795	222.983	0	0.571637
17.9	158.97	57.6846	222.127	0	0.56924
18	160.576	57.8888	221.275	0	0.566853
18.1	162.186	58.0922	220.427	0	0.564475
18.2	163.803	58.2947	219.582	0	0.562108
18.3	165.425	58.4964	218.741	0	0.559751
18.4	167.053	58.6973	217.903	0	0.557402
18.5	168.686	58.8972	217.069	0	0.555064
18.6	170.325	59.0964	216.238	0	0.552736
18.7	171.969	59.2947	215.41	0	0.550417
18.8	173.619	59.4922	214.587	0	0.548108
18.9	175.274	59.6888	213.766	0	0.545808
19	176.935	59.8847	212.949	0	0.543518
19.1	178.601	60.0797	212.136	0	0.541238
19.2	180.273	60.2739	211.326	0	0.538966
19.3	181.95	60.4673	210.519	0	0.536704
19.4	183.632	60.6598	209.716	0	0.534452
19.5	185.32	60.8516	208.916	0	0.532209
19.6	187.013	61.0425	208.171	0	0.529977
19.7	188.711	61.2328	207.61	0	0.52815
19.8	190.415	61.4225	207.051	0	0.52656
19.9	192.123	61.6116	206.494	0	0.524976
20	193.837	61.8001	205.938	0	0.523395
20.1	195.557	61.9881	205.391	0	0.52182
20.2	197.281	62.1755	204.886	0	0.520305
20.3	199.011	62.3624	204.392	0	0.518893
20.4	200.746	62.5488	203.9	0	0.517485
20.5	202.486	62.7347	203.409	0	0.51608
20.6	204.231	62.9201	202.92	0	0.51468
20.7	205.981	63.105	202.431	0	0.513283
20.8	207.737	63.2894	201.944	0	0.511889

3576

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012883

20.9	209.497	63.4733	201.459	0	0.5105
21	211.263	63.6567	200.975	0	0.509114
21.1	213.034	63.8396	200.492	0	0.507731
21.2	214.81	64.022	200.01	0	0.506352
21.3	216.591	64.2038	199.53	0	0.504977
21.4	218.377	64.3853	199.051	0	0.503606
21.5	220.168	64.5662	198.573	0	0.502238
21.6	221.963	64.7466	198.096	0	0.500873
21.7	223.765	64.9265	197.621	0	0.499513
21.8	225.571	65.106	197.147	0	0.498155
21.9	227.382	65.2849	196.675	0	0.496801
22	229.197	65.4634	196.203	0	0.495451
22.1	231.018	65.6414	195.733	0	0.494104
22.2	232.844	65.8189	195.264	0	0.492761
22.3	234.675	65.9959	194.797	0	0.491421
22.4	236.511	66.1724	194.33	0	0.490085
22.5	238.351	66.3485	193.865	0	0.488751
22.6	240.197	66.5241	193.401	0	0.487421
22.7	242.047	66.6992	192.938	0	0.486095
22.8	243.902	66.8738	192.477	0	0.484772
22.9	245.762	67.048	192.017	0	0.483453
23	247.627	67.2217	191.558	0	0.482137
23.1	249.497	67.3949	191.101	0	0.480826
23.2	251.371	67.5676	190.645	0	0.479518
23.3	253.251	67.7399	190.19	0	0.478213
23.4	255.135	67.9117	189.736	0	0.476911
23.5	257.023	68.083	189.284	0	0.475613
23.6	258.917	68.2539	188.832	0	0.474319
23.7	260.815	68.4243	188.382	0	0.473028
23.8	262.718	68.5942	187.934	0	0.47174
23.9	264.626	68.7637	187.486	0	0.470456
24	266.539	68.9327	187.04	0	0.469175
24.1	268.456	69.1012	186.595	0	0.467897
24.2	270.377	69.2693	186.151	0	0.466623
24.3	272.304	69.437	185.708	0	0.465351
24.4	274.235	69.6042	185.266	0	0.464083
24.5	276.171	69.7709	184.825	0	0.462818
24.6	278.111	69.9372	184.386	0	0.461557
24.7	280.056	70.103	183.946	0	0.460298
24.8	282.006	70.2683	183.506	0	0.459034
24.9	283.96	70.4332	183.067	0	0.457774
25	285.919	70.5977	182.629	0	0.456517
25.1	287.882	70.7617	182.192	0	0.455263
25.2	289.85	70.9253	181.757	0	0.454012
25.3	291.822	71.0884	181.323	0	0.452765
25.4	293.799	71.251	180.889	0	0.451521
25.5	295.781	71.4132	180.458	0	0.450281
25.6	297.767	71.575	180.027	0	0.449044
25.7	299.757	71.7363	179.597	0	0.44781
25.8	301.752	71.8972	179.169	0	0.446579
25.9	303.751	72.0576	178.742	0	0.445352
26	305.755	72.2176	178.316	0	0.444128
26.1	307.764	72.3772	177.891	0	0.442907
26.2	309.776	72.5363	177.468	0	0.441689
26.3	311.793	72.695	177.045	0	0.440475

SL

0

3577

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012884

31.3

26.4	313.815	72.8532	176.624	0	0.439264
26.5	315.841	73.011	176.204	0	0.438056
26.6	317.871	73.1684	175.785	0	0.436851
26.7	319.906	73.3254	175.367	0	0.43565
26.8	321.945	73.4819	174.95	0	0.434451
26.9	323.988	73.638	174.534	0	0.433256
27	326.036	73.7936	174.12	0	0.432064
27.1	328.088	73.9488	173.707	0	0.430875
27.2	330.144	74.1036	173.295	0	0.42969
27.3	332.204	74.258	172.884	0	0.428508
27.4	334.269	74.412	172.474	0	0.427328
27.5	336.338	74.5655	172.065	0	0.426152
27.6	338.412	74.7186	171.657	0	0.424979
27.7	340.489	74.8713	171.251	0	0.42381
27.8	342.571	75.0235	170.845	0	0.422643
27.9	344.657	75.1754	170.441	0	0.421479
28	346.748	75.3268	170.038	0	0.420319
28.1	348.842	75.4778	169.636	0	0.419161
28.2	350.941	75.6284	169.235	0	0.418007
28.3	353.044	75.7786	168.835	0	0.416856
28.4	355.151	75.9283	168.436	0	0.415708
28.5	357.262	76.0777	168.039	0	0.414563
28.6	359.377	76.2266	167.642	0	0.413421
28.7	361.497	76.3751	167.247	0	0.412282
28.8	363.62	76.5233	166.853	0	0.411146
28.9	365.748	76.671	166.459	0	0.410013
29	367.88	76.8183	166.067	0	0.408884
29.1	370.016	76.9652	165.676	0	0.407757
29.2	372.156	77.1117	165.286	0	0.406633
29.3	374.3	77.2578	164.897	0	0.405512
29.4	376.448	77.4035	164.509	0	0.404395
29.5	378.6	77.5487	164.122	0	0.40328
29.6	380.756	77.6936	163.737	0	0.402168
29.7	382.916	77.8381	163.352	0	0.401059
29.8	385.08	77.9822	162.968	0	0.399953
29.9	387.249	78.1259	162.586	0	0.39885
30	389.421	78.2692	162.204	0	0.397751
30.1	391.597	78.4121	161.824	0	0.396654
30.2	393.777	78.5546	161.444	0	0.395559
30.3	395.961	78.6967	161.066	0	0.394468
30.4	398.149	78.8385	160.689	0	0.39338
30.5	400.341	78.9798	160.312	0	0.392295
30.6	402.537	79.1207	159.938	0	0.391214
30.7	404.737	79.2613	159.565	0	0.390137
30.8	406.94	79.4015	159.193	0	0.389063
30.9	409.148	79.5412	158.822	0	0.387992
31	411.359	79.6806	158.452	0	0.386924
31.1	413.574	79.8196	158.082	0	0.385859
31.2	415.794	79.9583	96.9871	0	0.384797
31.3	418.016	80	15.0791	0	0
31.4	420.238	80	15.0791	0	0
31.5	422.46	80	15.0791	0	0
31.6	424.682	80	-115.255	0	0
31.7	426.902	79.7555	-310.524	-82.7136	-1.04278
31.8	429.112	79.3595	-312.354	-80.9563	-1.1

3578

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls



31.9	431.311	78.9635	-314.184	-79.1982	-1.1
32	433.499	78.5675	-316.019	-77.4352	-1.1
32.1	435.676	78.1715	-317.854	-75.6721	-1.1
32.2	437.842	77.7755	-319.689	-73.9084	-1.1
32.3	439.997	77.3795	-321.524	-72.1447	-1.1
32.4	442.141	76.9835	-323.359	-70.3806	-1.1
32.5	444.274	76.5875	-325.194	-68.6161	-1.1
32.6	446.395	76.1915	-327.029	-66.8517	-1.1
32.7	448.506	75.7955	-328.863	-65.087	-1.1
32.8	450.606	75.3995	-330.698	-63.3225	-1.1
32.9	452.695	75.0035	-332.532	-61.5577	-1.1
33	454.773	74.6075	-334.367	-59.7923	-1.1
33.1	456.84	74.2115	-336.202	-58.0269	-1.10E+00
33.2	458.896	73.8155	-338.037	-56.2605	-1.10E+00
33.3	460.941	73.4195	-339.872	-54.494	-1.10E+00
33.4	462.975	73.0235	-341.707	-52.7272	-1.10E+00
33.5	464.998	72.6275	-343.542	-50.9598	-1.10E+00
33.6	467.01	72.2315	-345.377	-49.1925	-1.10E+00
33.7	469.011	71.8355	-347.212	-47.4246	-1.10E+00
33.8	471.001	71.4395	-349.047	-45.6566	-1.10E+00
33.9	472.98	71.0435	-350.882	-43.8885	-1.10E+00
34	474.948	70.6475	-352.717	-42.12	-1.10E+00
34.1	476.905	70.2515	-354.552	-40.3516	-1.10E+00
34.2	478.85	69.8555	-356.549	-38.4203	-1.10E+00
34.3	480.785	69.4595	-358.829	-36.2065	-1.10E+00
34.4	482.709	69.0635	-361.108	-33.9925	-1.10E+00
34.5	484.622	68.6675	-363.41	-31.7561	-1.10E+00
34.6	486.524	68.2715	-365.716	-29.5154	-1.10E+00
34.7	488.415	67.8755	-367.615	-27.6814	-1.10E+00
34.8	490.295	67.4795	-368.625	-26.7352	-1.10E+00
34.9	492.164	67.0835	-369.636	-25.7887	-1.10E+00
35	494.022	66.6875	-369.849	-25.6391	-1.10E+00
35.1	495.869	66.2915	-369.849	-25.7025	-1.10E+00
35.2	497.705	65.8955	-369.85	-25.7656	-1.10E+00
35.3	499.529	65.4995	-369.85	-25.8287	-1.10E+00
35.4	501.343	65.1035	-369.85	-25.8917	-1.10E+00
35.5	503.146	64.7075	-369.85	-25.9541	-1.10E+00
35.6	504.938	64.3115	-369.85	-26.0166	-1.10E+00
35.7	506.719	63.9155	-369.85	-26.0785	-1.10E+00
35.8	508.489	63.5195	-369.85	-26.1402	-1.10E+00
35.9	510.248	63.1235	-369.85	-26.2017	-1.10E+00
36	511.996	62.7275	-369.85	-26.2627	-1.10E+00
36.1	513.733	62.3315	-369.85	-26.3236	-1.10E+00
36.2	515.459	61.9355	-369.85	-26.3844	-1.10E+00
36.3	517.174	61.5395	-369.849	-26.4459	-1.10E+00
36.4	518.878	61.1435	-369.848	-26.5073	-1.10E+00
36.5	520.57	60.7475	-369.848	-26.5675	-1.10E+00
36.6	522.253	60.3515	-369.848	-26.6272	-1.10E+00
36.7	523.924	59.9555	-369.848	-26.6865	-1.10E+00
36.8	525.583	59.5595	-369.848	-26.7456	-1.10E+00
36.9	527.232	59.1635	-369.848	-26.8046	-1.10E+00
37	528.87	58.7675	-369.848	-26.863	-1.10E+00
37.1	530.497	58.3715	-369.848	-26.9214	-1.10E+00
37.2	532.113	57.9755	-369.848	-26.9792	-1.10E+00
37.3	533.718	57.5795	-369.848	-27.0369	-1.10E+00

00012885

5/

9

3579

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012886

37.4	535.312	57.1835	-369.848	-27.0944	-1.10E+00
37.5	536.895	56.7875	-369.848	-27.1514	-1.10E+00
37.6	538.467	56.3915	-369.848	-27.2083	-1.10E+00
37.7	540.028	55.9955	-369.848	-27.2649	-1.10E+00
37.8	541.577	55.5995	-369.848	-27.3213	-1.10E+00
37.9	543.117	55.2035	-369.849	-27.3776	-1.10E+00
38	544.644	54.8075	-369.849	-27.4334	-1.10E+00
38.1	546.162	54.4115	-369.849	-27.4892	-1.10E+00
38.2	547.667	54.0155	-369.849	-27.5444	-1.10E+00
38.3	549.162	53.6195	-369.849	-27.5994	-1.10E+00
38.4	550.646	53.2235	-369.849	-27.6541	-1.10E+00
38.5	552.119	52.8275	-369.849	-27.7085	-1.10E+00
38.6	553.581	52.4315	-369.849	-27.7629	-1.10E+00
38.7	555.032	52.0355	-369.849	-27.8169	-1.10E+00
38.8	556.472	51.6395	-369.849	-27.8708	-1.10E+00
38.9	557.901	51.2435	-369.849	-27.9246	-1.10E+00
39	559.319	50.8475	-369.849	-27.9778	-1.10E+00
39.1	560.726	50.4515	-369.849	-28.031	-1.10E+00
39.2	562.122	50.0555	-369.849	-28.0838	-1.10E+00
39.3	563.506	49.6595	-369.847	-28.138	-1.10E+00
39.4	564.881	49.2635	-369.845	-28.1923	-1.10E+00
39.5	566.243	48.8675	-369.844	-28.2452	-1.10E+00
39.6	567.595	48.4715	-369.844	-28.2967	-1.10E+00
39.7	568.937	48.0755	-369.844	-28.3479	-1.1
39.8	570.266	47.6795	-369.844	-28.3991	-1.1
39.9	571.585	47.2835	-369.844	-28.45	-1.1
40	572.893	46.8875	-369.844	-28.5003	-1.1
40.1	574.19	46.4915	-369.845	-28.5504	-1.1
40.2	575.476	46.0955	-369.845	-28.6003	-1.1
40.3	576.751	45.6995	-369.845	-28.6499	-1.1
40.4	578.015	45.3035	-369.845	-28.6994	-1.1
40.5	579.267	44.9075	-369.845	-28.7486	-1.1
40.6	580.509	44.5115	-369.845	-28.7978	-1.1
40.7	581.74	44.1155	-369.845	-28.8467	-1.1
40.8	582.961	43.7195	-369.845	-28.8951	-1.1
40.9	584.169	43.3235	-369.845	-28.9434	-1.1
41	585.367	42.9275	-369.845	-28.9913	-1.1
41.1	586.554	42.5315	-369.845	-29.0391	-1.1
41.2	587.73	42.1355	-369.845	-29.0865	-1.1
41.3	588.895	41.7395	-369.845	-29.1333	-1.1
41.4	590.049	41.3435	-369.845	-29.1802	-1.1
41.5	591.192	40.9475	-369.845	-29.2265	-1.1
41.6	592.323	40.5515	-369.845	-29.2727	-1.1
41.7	593.444	40.1555	-369.845	-29.3187	-1.1
41.8	594.554	39.7595	-369.846	-29.3642	-1.1
41.9	595.653	39.3635	-369.846	-29.4095	-1.1
42	596.741	38.9675	-369.846	-29.4545	-1.1
42.1	597.818	38.5715	-369.846	-29.4995	-1.1
42.2	598.885	38.1755	-369.846	-29.5442	-1.1
42.3	599.94	37.7795	-369.846	-29.5887	-1.1
42.4	600.984	37.3835	-369.846	-29.633	-1.1
42.5	602.017	36.9875	-369.846	-29.6769	-1.1
42.6	603.039	36.5915	-369.846	-29.7206	-1.1
42.7	604.049	36.1955	-369.846	-29.764	-1.1
42.8	605.049	35.7995	-369.846	-29.8068	-1.1

0.7208

[Handwritten signature]

[Handwritten mark]

3589

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012887

42.9	606.038	35.4035	-369.847	-29.8495	-1.1
43	607.016	35.0075	-369.847	-29.8918	-1.1
43.1	607.983	34.6115	-369.842	-29.9386	-1.1
43.2	608.939	34.2155	-369.838	-29.9852	-1.1
43.3	609.884	33.8195	-369.835	-30.0294	-1.1
43.4	610.817	33.4235	-369.836	-30.0709	-1.1
43.5	611.74	33.0275	-369.836	-30.1119	-1.1
43.6	612.652	32.6315	-369.841	-30.1474	-1.1
43.7	613.552	32.2355	-369.848	-30.1821	-1.1
43.8	614.442	31.8395	-369.851	-30.2189	-1.1
43.9	615.321	31.4435	-369.851	-30.259	-1.1
44	616.19	31.0475	-369.851	-30.2987	-1.1
44.1	617.047	30.6515	-369.851	-30.3383	-1.1
44.2	617.893	30.2555	-369.851	-30.3775	-1.1
44.3	618.727	29.8595	-369.851	-30.4165	-1.1
44.4	619.55	29.4635	-369.851	-30.4553	-1.1
44.5	620.363	29.0675	-369.851	-30.4938	-1.1
44.6	621.166	28.6715	-369.851	-30.5321	-1.1
44.7	621.958	28.2755	-369.851	-30.5702	-1.1
44.8	622.736	27.8795	-369.851	-30.6081	-1.1
44.9	623.505	27.4835	-369.851	-30.6457	-1.1
45	624.263	27.0875	-369.851	-30.683	-1.1
45.1	625.012	26.6915	-369.851	-30.7201	-1.1
45.2	625.746	26.2955	-369.851	-30.7568	-1.1
45.3	626.47	25.8995	-369.851	-30.7933	-1.1
45.4	627.185	25.5035	-369.851	-30.8296	-1.1
45.5	627.889	25.1075	-369.852	-30.8656	-1.1
45.6	628.579	24.7115	-369.852	-30.9013	-1.1
45.7	629.26	24.3155	-369.852	-30.9368	-1.1
45.8	629.932	23.9195	-369.852	-30.9718	-1.1
45.9	630.588	23.5235	-369.852	-31.0065	-1.1
46	631.237	23.1275	-369.852	-31.0411	-1.1
46.1	631.875	22.7315	-369.852	-31.0756	-1.1
46.2	632.499	22.3355	-369.852	-31.1094	-1.1
46.3	633.116	21.9395	-369.852	-31.143	-1.1
46.4	633.718	21.5435	-369.852	-31.1763	-1.1
46.5	634.311	21.1475	-369.852	-31.2095	-1.1
46.6	634.894	20.7515	-369.852	-31.2425	-1.1
46.7	635.463	20.3555	-369.852	-31.2752	-1.1
46.8	636.026	19.9595	-369.852	-31.3077	-1.1
46.9	636.571	19.5635	-369.852	-31.3398	-1.1
47	637.112	19.1675	-369.852	-31.3718	-1.1
47.1	637.636	18.7715	-369.852	-31.4035	-1.1
47.2	638.154	18.3755	-369.852	-31.435	-1.1
47.3	638.657	17.9795	-369.852	-31.4661	-1.1
47.4	639.152	17.5835	-369.852	-31.497	-1.1
47.5	639.633	17.1875	-369.852	-31.5275	-1.1
47.6	640.108	16.7915	-369.852	-31.5579	-1.1
47.7	640.565	16.3955	-369.852	-31.5876	-1.1
47.8	641.021	15.9995	-369.852	-31.6174	-1.1
47.9	641.453	15.6035	-369.852	-31.6468	-1.1
48	641.885	15.2075	-369.852	-31.6763	-1.1
48.1	642.298	14.8115	-369.852	-31.7053	-1.1
48.2	642.704	14.4155	-369.852	-31.7341	-1.1
48.3	643.102	14.0195	-369.852	-31.7626	-1.1

3581

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012888

48.4	643.48	13.6235	-369.852	-31.7905	-1.1
48.5	643.858	13.2275	-369.852	-31.8184	-1.1
48.6	644.217	12.8315	-369.852	-31.8459	-1.1
48.7	644.564	12.4355	-369.852	-31.8731	-1.1
48.8	644.912	12.0395	-369.852	-31.9004	-1.1
48.9	645.234	11.6435	-369.852	-31.9271	-1.1
49	645.549	11.2475	-369.852	-31.9537	-1.1
49.1	645.863	10.8515	-369.852	-31.9803	-1.1
49.2	646.156	10.4555	-369.852	-32.0063	-1.1
49.3	646.432	10.0595	-369.852	-32.0319	-1.1
49.4	646.709	9.66353	-345.488	-56.4212	-1.1
49.5	646.986	9.26753	-316.814	-85.1214	-1.1
49.6	647.221	8.87153	-287.928	-114.029	-1.1
49.7	647.455	8.47554	-258.603	-143.375	-1.1
49.8	647.688	8.07954	-2.29E+02	-172.722	-1.1
49.9	647.921	7.68354	-2.00E+02	-202.068	-1.1
50	648.119	7.28755	-1.71E+02	-231.384	-1.09999
50.1	648.298	6.89156	-1.41E+02	-260.684	-1.09999
50.2	648.477	6.49557	-1.12E+02	-289.984	-1.09998
50.3	648.656	6.09959	-8.27E+01	-319.284	-1.09997
50.4	648.835	5.7036	-5.33E+01	-348.584	-1.09997
50.5	649.006	5.30764	-2.40E+01	-377.885	-1.09996
50.6	649.08	4.91191	-1.12E+00	-400.774	-1.0999
50.7	649.154	4.51618	-0.633347	-401.26	-1.09985
50.8	649.228	4.12045	-0.147783	-401.745	-1.0998
50.9	649.302	3.72472	2.46E-05	-401.893	-1.09975
51	649.376	3.32899	4.82E-05	-401.893	-1.09969
51.1	649.45	2.93326	7.59E-05	-401.893	-1.09964
51.2	649.525	2.53753	1.24E-04	-401.893	-1.09959
51.3	649.599	2.1418	1.72E-04	-401.893	-1.09953
51.4	649.673	1.74607	2.82E-04	-401.893	-1.09948
51.5	649.747	1.35034	4.26E-04	-401.893	-1.09943
51.6	649.821	0.954614	5.29E-04	-401.894	-1.09938
51.7	649.895	0.558885	3.10E-04	-401.893	-1.09932
51.8	649.969	0.163156	9.04E-05	-401.893	-1.09927
51.9	650	0	0	0	0
52	650	0	0	0	0
52.1	650	0	0	0	0
52.2	650	0	0	0	0
52.3	650	0	0	0	0
52.4	650	0	0	0	0
52.5	650	0	0	0	0
52.6	650	0	0	0	0
52.7	650	0	0	0	0
52.8	650	0	0	0	0
52.9	650	0	0	0	0
53	650	0	0	0	0
53.1	650	0	0	0	0
53.2	650	0	0	0	0
53.3	650	0	0	0	0
53.4	650	0	0	0	0
53.5	650	0	0	0	0
53.6	650	0	0	0	0
53.7	650	0	0	0	0
53.8	650	0	0	0	0

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls



53.9	650	0	0	0	0
54	650	0	0.00E+00	0	0
54.1	650	0	0.00E+00	0	0
54.2	650	0	0.00E+00	0	0
54.3	650	0	0.00E+00	0	0
54.4	650	0	0.00E+00	0	0
54.5	650	0	0.00E+00	0	0
54.6	650	0	0.00E+00	0	0
54.7	650	0	0.00E+00	0	0
54.8	650	0	0.00E+00	0	0
54.9	650	0	0.00E+00	0	0
55	650	0	0.00E+00	0	0
55.1	650	0	0.00E+00	0	0
55.2	650	0	0.00E+00	0	0
55.3	650	0	0.00E+00	0	0
55.4	650	0	0.00E+00	0	0
55.5	650	0	0.00E+00	0	0
55.6	650	0	0.00E+00	0	0
55.7	650	0	0.00E+00	0	0
55.8	650	0	0.00E+00	0	0
55.9	650	0	0.00E+00	0	0
56	650	0	0.00E+00	0	0
56.1	650	0	0.00E+00	0	0
56.2	650	0	0.00E+00	0	0
56.3	650	0	0.00E+00	0	0
56.4	650	0	0.00E+00	0	0
56.5	650	0	0.00E+00	0	0
56.6	650	0	0.00E+00	0	0
56.7	650	0	0.00E+00	0	0
56.8	650	0	0.00E+00	0	0
56.9	650	0	0.00E+00	0	0
57	650	0	0.00E+00	0	0
57.1	650	0	0.00E+00	0	0
57.2	650	0	0.00E+00	0	0
57.3	650	0	0.00E+00	0	0
57.4	650	0.00E+00	0.00E+00	0	0
57.5	650	0	0.00E+00	0	0
57.6	650	0	0.00E+00	0	0
57.7	650	0	0.00E+00	0	0
57.8	650	0	0.00E+00	0	0
57.9	650	0	0.00E+00	0	0
58	650	0	0.00E+00	0	0
58.1	650	0	0.00E+00	0	0
58.2	650	0	0.00E+00	0	0
58.3	650	0.00E+00	0.00E+00	0	0
58.4	650	0	0	0	0
58.5	650	0	0	0	0
58.6	650	0	0	0	0
58.7	650	0	0	0	0
58.8	650	0	0	0	0
58.9	650	0	0	0	0
59	650	0	0	0	0
59.1	650	0	0	0	0
59.2	650	0	0	0	0
59.3	650	0	0	0	0

00012889



3583

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

59.4	650	0	0	0	0
59.5	650	0	0	0	0
59.6	650	0	0	0	0
59.7	650	0	0	0	0
59.8	650	0	0	0	0
59.9	650	0	0	0	0
60	650	0	0	0	0
60.1	650	0	0	0	0
60.2	650	0	0	0	0
60.3	650	0	0	0	0
60.4	650	0	0	0	0
60.5	650	0	0	0	0
60.6	650	0	0	0	0
60.7	650	0	0	0	0
60.8	650	0	0	0	0
60.9	650	0	0	0	0
61	650	0	0	0	0
61.1	650	0	0	0	0
61.2	650	0	0	0	0
61.3	650	0	0	0	0
61.4	650	0	0	0	0
61.5	650	0	0	0	0
61.6	650	0	0	0	0
61.7	650	0	0	0	0
61.8	650	0	0	0	0
61.9	650	0	0	0	0
62	650	0	0	0	0
62.1	650	0	0	0	0
62.2	650	0	0	0	0
62.3	650	0	0	0	0
62.4	650	0	0	0	0
62.5	650	0	0	0	0
62.6	650	0	0	0	0
62.7	650	0	0	0	0
62.8	650	0	0	0	0
62.9	650	0	0	0	0
63	650	0	0	0	0
63.1	650	0	0	0	0
63.2	650	0	0	0	0
63.3	650	0	0	0	0
63.4	650	0	0	0	0
63.5	650	0	0	0	0
63.6	650	0	0	0	0
63.7	650	0	0	0	0
63.8	650	0	0	0	0
63.9	650	0	0	0	0
64	650	0	0	0	0
64.1	650	0	0	0	0
64.2	650	0	0	0	0
64.3	650	0	0	0	0
64.4	650	0	0	0	0
64.5	650	0	0	0	0
64.6	650	0	0	0	0
64.7	650	0	0	0	0
64.8	650	0	0	0	0

00012390




3584

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012891

64.9	650	0	0	0	0
65	650	0	0	0	0
65.1	650	0	0	0	0
65.2	650	0	0	0	0
65.3	650	0	0	0	0
65.4	650	0	0	0	0
65.5	650	0	0	0	0
65.6	650	0	0	0	0
65.7	650	0	0	0	0
65.8	650	0	0	0	0
65.9	650	0	0	0	0
66	650	0	0	0	0
66.1	650	0	0	0	0
66.2	650	0	0	0	0
66.3	650	0	0	0	0
66.4	650	0	0	0	0
66.5	650	0	0	0	0
66.6	650	0	0	0	0
66.7	650	0	0	0	0
66.8	650	0	0	0	0
66.9	650	0	0	0	0
67	650	0	0	0	0
67.1	650	0	0	0	0
67.2	650	0	0	0	0
67.3	650	0	0	0	0
67.4	650	0	0	0	0
67.5	650	0	0	0	0
67.6	650	0	0	0	0
67.7	650	0	0	0	0
67.8	650	0	0	0	0
67.9	650	0	0	0	0
68	650	0	0	0	0
68.1	650	0	0	0	0
68.2	650	0	0	0	0
68.3	650	0	0	0	0
68.4	650	0	0	0	0
68.5	650	0	0	0	0
68.6	650	0	0	0	0
68.7	650	0	0	0	0
68.8	650	0	0	0	0
68.9	650	0	0	0	0



3585

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

Cycle B1

7C 5M AW1 4p/m²

00012892

Max acceleration

1.13 m/s²

Max Speed

75.0 Km/h

Coastin time

3 s

Stop Time

17.0 s

Cycle time

52.6 s

Total Distance

670 m

time(s)	distance(m)	speed(km/h)	F_elec(kN)	F_brakeP(kN)	gamma(m/s2)	gradient(0/00)
0	0	0	397.181	0	1.13355	0
0.1	7.53E-02	0.408078	397.181	0	1.13E+00	0.00E+00
0.2	0.150569	0.816156	397.181	0	1.13355	0
0.3	0.225853	1.22423	397.181	0	1.13355	0
0.4	0.301138	1.63231	397.181	0	1.13355	0
0.5	0.376422	2.04039	397.181	0	1.13355	0
0.6	0.451707	2.44847	397.181	0	1.13355	0
0.7	0.526991	2.85655	397.181	0	1.13355	0
0.8	0.602276	3.26463	397.181	0	1.13355	0
0.9	0.67756	3.6727	397.181	0	1.13355	0
1	0.752845	4.08078	397.181	0	1.13355	0
1.1	0.828129	4.48886	397.181	0	1.13355	0
1.2	0.903414	4.89694	397.181	0	1.13355	0
1.3	0.978698	5.30502	397.181	0	1.13355	0
1.4	1.13031	5.7129	397.181	0	1.13345	0
1.5	1.31205	6.1207	397.181	0	1.13331	0
1.6	1.49378	6.5285	397.181	0	1.13317	0
1.7	1.67552	6.93631	397.181	0	1.13303	0
1.8	1.85725	7.34411	397.181	0	1.13289	0
1.9	2.0508	7.75188	397.181	0	1.13277	0
2	2.28761	8.15956	397.181	0	1.13268	0
2.1	2.52442	8.56723	397.181	0	1.1326	0
2.2	2.76123	8.9749	397.181	0	1.13251	0
2.3	2.99805	9.38258	397.181	0	1.13243	0
2.4	3.27856	9.79015	397.181	0	1.13235	0
2.5	3.55943	10.1977	397.181	0	1.13226	0
2.6	3.8403	10.6053	397.181	0	1.13218	0
2.7	4.13753	11.0128	397.181	0	1.1321	0
2.8	4.45631	11.4203	397.181	0	1.13202	0
2.9	4.7751	11.8278	397.181	0	1.13193	0
3	5.10383	12.2352	397.181	0	1.13185	0
3.1	5.45641	12.6426	397.181	0	1.13177	0
3.2	5.809	13.05	397.181	0	1.13169	0
3.3	6.1757	13.4573	397.181	0	1.1316	0
3.4	6.55908	13.8647	397.181	0	1.13152	0
3.5	6.94247	14.272	397.181	0	1.13143	0
3.6	7.35007	14.6792	397.181	0	1.13135	0
3.7	7.76194	15.0865	397.181	0	1.13126	0
3.8	8.18505	15.4937	397.181	0	1.13118	0
3.9	8.62355	15.9008	397.181	0	1.13109	0
4	9.06561	16.308	397.181	0	1.131	0
4.1	9.5292	16.7151	397.181	0	1.13091	0
4.2	9.9928	17.1222	397.181	0	1.13082	0
4.3	10.4798	17.5292	397.181	0	1.13073	0

3586

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

00012893

ALSTOM

4.4	10.9672	17.9362	397.181	0	1.13065	0
4.5	11.4758	18.3432	397.181	0	1.13055	0
4.6	11.9858	18.7502	397.181	0	1.13046	0
4.7	12.517	19.1571	397.181	0	1.13037	0
4.8	13.0507	19.564	397.181	0	1.13028	0
4.9	13.6033	19.9708	397.181	0	1.13018	0
5	14.1616	20.3776	397.181	0	1.13009	0
5.1	14.7344	20.7844	397.181	0	1.12999	0
5.2	15.3175	21.1912	397.181	0	1.1299	0
5.3	15.9096	21.5979	397.181	0	1.1298	0
5.4	16.5176	22.0046	397.181	0	1.1297	0
5.5	17.1324	22.4112	397.181	0	1.12961	0
5.6	17.7615	22.8178	397.181	0	1.12951	0
5.7	18.4017	23.2244	397.181	0	1.12941	0
5.8	19.0498	23.631	397.181	0	1.12931	0
5.9	19.7139	24.0375	397.181	0	1.12921	0
6	20.3867	24.4073	397.181	0	1.05988	20
6.1	21.0677	24.7493	397.181	0	0.950016	20
6.2	21.7611	25.0912	397.183	0	0.949929	20
6.3	22.4634	25.4332	397.188	0	0.949847	20
6.4	23.1735	25.7751	397.193	0	0.949769	20
6.5	23.8938	26.117	397.197	0	0.949698	20
6.6	24.6252	26.4588	397.198	0	0.949622	20
6.7	25.3648	26.8006	397.198	0	0.949539	20
6.8	26.1129	27.1424	397.198	0	0.949451	20
6.9	26.8717	27.4842	397.195	0	0.94936	20
7	27.6408	27.8259	397.192	0	0.949262	20
7.1	28.4186	28.1676	397.191	0	0.949162	20
7.2	29.2051	28.5093	397.191	0	0.949063	20
7.3	30.0005	28.8509	397.191	0	0.948972	20
7.4	30.8078	29.1925	397.192	0	0.948879	20
7.5	31.624	29.5341	397.192	0	0.948787	20
7.6	32.4492	29.8756	397.192	0	0.948693	20
7.7	33.2834	30.2171	397.192	0	0.948599	20
7.8	34.1269	30.5585	397.193	0	0.948504	20
7.9	34.9799	30.9	397.193	0	0.94841	20
8	35.8437	31.2414	397.192	0	0.948315	20
8.1	36.7167	31.5827	397.19	0	0.948215	20
8.2	37.5989	31.924	397.189	0	0.948112	20
8.3	38.4904	32.2653	397.188	0	0.948009	20
8.4	39.3913	32.6066	397.188	0	0.947908	20
8.5	40.3016	32.9478	397.188	0	0.94781	20
8.6	41.2213	33.2889	397.188	0	0.947711	20
8.7	42.1505	33.6301	397.188	0	0.947611	20
8.8	43.0892	33.9712	397.001	0	0.94751	20
8.9	44.0373	34.3122	394.993	0	0.947182	20
9	44.995	34.651	392.611	0	0.941251	20
9.1	45.9623	34.9872	390.244	0	0.934186	20
9.2	46.9389	35.3209	386.11	0	0.927165	20
9.3	47.9247	35.6503	381.957	0	0.915105	20
9.4	48.9195	35.9753	377.86	0	0.902867	20
9.5	49.9232	36.296	373.816	0	0.890797	20
9.6	50.9358	36.6125	369.827	0	0.87889	20
9.7	51.9571	36.9248	365.89	0	0.867145	20
9.8	52.9869	37.2329	362.005	0	0.855559	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012894

9.9	54.0254	37.5368	358.173	0	0.844135	20
10	55.0725	37.8367	354.393	0	0.832867	20
10.1	56.1277	38.1325	350.663	0	0.821753	20
10.2	57.1912	38.4245	346.982	0	0.810789	20
10.3	58.2627	38.7125	343.351	0	0.799973	20
10.4	59.342	38.9968	339.767	0	0.789303	20
10.5	60.4292	39.2772	336.231	0	0.778776	20
10.6	61.5241	39.554	332.741	0	0.768392	20
10.7	62.6266	39.8271	329.298	0	0.758146	20
10.8	63.7365	40.0967	325.899	0	0.748038	20
10.9	64.8538	40.3627	322.546	0	0.738065	20
11	65.9783	40.6252	319.236	0	0.728224	20
11.1	67.1106	40.8839	316.003	0	0.718525	20
11.2	68.2501	41.1393	313.198	0	0.709152	20
11.3	69.3965	41.3918	310.819	0	0.701098	20
11.4	70.5498	41.646	308.424	0	0.707452	20
11.5	71.7101	41.902	306.013	0	0.710401	20
11.6	72.8773	42.155	304.198	0	0.701814	20
11.7	74.0516	42.4056	302.718	0	0.695296	20
11.8	75.2333	42.6538	301.266	0	0.689446	20
11.9	76.4217	42.9	299.826	0	0.683624	20
12	77.6167	43.1442	298.398	0	0.677828	20
12.1	78.8183	43.3864	296.982	0	0.67206	20
12.2	80.0265	43.6266	295.578	0	0.666318	20
12.3	81.242	43.8644	294.186	0	0.660607	20
12.4	82.4639	44.1004	292.807	0	0.654923	20
12.5	83.6921	44.3343	291.439	0	0.649264	20
12.6	84.9265	44.5663	290.082	0	0.643632	20
12.7	86.1678	44.7962	288.738	0	0.638029	20
12.8	87.4155	45.024	287.405	0	0.632454	20
12.9	88.6693	45.2499	286.084	0	0.626904	20
13	89.929	45.4739	284.774	0	0.621379	20
13.1	91.1954	45.6962	283.474	0	0.61741	20
13.2	92.468	45.9172	282.181	0	0.613557	20
13.3	93.7464	46.1369	280.896	0	0.609727	20
13.4	95.0308	46.3553	279.62	0	0.60592	20
13.5	96.3218	46.5721	278.351	0	0.602139	20
13.6	97.6185	46.7877	277.091	0	0.598381	20
13.7	98.9208	47.002	275.838	0	0.594645	20
13.8	100.23	47.2148	274.593	0	0.590934	20
13.9	101.544	47.4264	273.356	0	0.587246	20
14	102.864	47.6367	272.126	0	0.58358	20
14.1	104.19	47.8456	270.904	0	0.579938	20
14.2	105.523	48.0532	269.69	0	0.576319	20
14.3	106.86	48.2596	268.483	0	0.572721	20
14.4	108.203	48.4646	267.284	0	0.569147	20
14.5	109.553	48.6684	266.092	0	0.565595	20
14.6	110.907	48.8709	264.908	0	0.562064	20
14.7	112.268	49.0721	263.731	0	0.558556	20
14.8	113.634	49.2721	262.562	0	0.55507	20
14.9	115.005	49.4709	261.399	0	0.551604	20
15	116.382	49.6684	260.244	0	0.548162	20
15.1	117.764	49.8647	259.096	0	0.544741	20
15.2	119.152	50.0597	257.955	0	0.54134	20
15.3	120.545	50.2535	256.822	0	0.537962	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012895

15.4	121.944	50.4462	255.695	0	0.534603	20
15.5	123.348	50.6376	254.576	0	0.531267	20
15.6	124.757	50.8279	253.463	0	0.527951	20
15.7	126.172	51.0169	252.358	0	0.524655	20
15.8	127.591	51.2048	251.259	0	0.52138	20
15.9	129.016	51.3915	250.167	0	0.518125	20
16	130.446	51.577	249.082	0	0.514892	20
16.1	131.882	51.7614	248.004	0	0.511677	20
16.2	133.322	51.9446	246.941	0	0.508483	20
16.3	134.767	52.1267	245.983	0	0.50537	20
16.4	136.218	52.3078	245.089	0	0.502636	20
16.5	137.673	52.488	244.199	0	0.499976	20
16.6	139.134	52.6672	243.314	0	0.497328	20
16.7	140.599	52.8454	242.434	0	0.494696	20
16.8	142.07	53.0227	241.576	0	0.492079	20
16.9	143.545	53.1991	240.84	0	0.489649	20
17	145.025	53.3747	240.107	0	0.487447	20
17.1	146.51	53.5495	239.378	0	0.485256	20
17.2	148	53.7236	238.652	0	0.483074	20
17.3	149.495	53.8968	237.929	0	0.480903	20
17.4	150.994	54.0693	237.21	0	0.478741	20
17.5	152.499	54.241	236.493	0	0.476589	20
17.6	154.008	54.412	235.78	0	0.474446	20
17.7	155.522	54.5821	235.071	0	0.472313	20
17.8	157.04	54.7515	234.364	0	0.470189	20
17.9	158.563	54.9201	233.66	0	0.468075	20
18	160.091	55.088	232.96	0	0.46597	20
18.1	161.624	55.2551	232.263	0	0.463874	20
18.2	163.161	55.4215	231.568	0	0.461788	20
18.3	164.703	55.5871	230.878	0	0.459711	20
18.4	166.249	55.752	230.19	0	0.457643	20
18.5	167.8	55.9162	229.505	0	0.455584	20
18.6	169.356	56.0796	228.823	0	0.453535	20
18.7	170.916	56.2423	228.144	0	0.451495	20
18.8	172.48	56.4042	227.469	0	0.449464	20
18.9	174.049	56.5654	226.796	0	0.447442	20
19	175.623	56.7259	226.127	0	0.445429	20
19.1	177.201	56.8856	225.46	0	0.443425	20
19.2	178.783	57.0447	224.797	0	0.44143	20
19.3	180.37	57.203	224.136	0	0.439444	20
19.4	181.961	57.3607	223.479	0	0.437467	20
19.5	183.557	57.5175	222.824	0	0.435498	20
19.6	185.156	57.6738	222.172	0	0.433539	20
19.7	186.761	57.8293	221.524	0	0.431588	20
19.8	188.369	57.9841	220.878	0	0.429646	20
19.9	189.982	58.1382	220.235	0	0.427712	20
20	191.599	58.2916	219.595	0	0.425787	20
20.1	193.22	58.4443	218.958	0	0.423871	20
20.2	194.846	58.5964	218.324	0	0.421963	20
20.3	196.476	58.7477	217.692	0	0.420064	20
20.4	198.11	58.8984	217.064	0	0.418173	20
20.5	199.748	59.0484	216.438	0	0.41629	20
20.6	201.39	59.1977	215.815	0	0.414416	20
20.7	203.036	59.3464	215.195	0	0.41255	20
20.8	204.687	59.4943	214.578	0	0.410693	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012896

20.9	206.342	59.6416	213.963	0	0.408844	20
21	208	59.7883	213.351	0	0.407003	20
21.1	209.663	59.9343	212.742	0	0.405171	20
21.2	211.33	60.0796	212.136	0	0.403347	20
21.3	213.001	60.2243	211.532	0	0.40153	20
21.4	214.676	60.3683	210.931	0	0.399722	20
21.5	216.355	60.5117	210.333	0	0.397922	20
21.6	218.038	60.6545	209.738	0	0.39613	20
21.7	219.725	60.7966	209.145	0	0.394346	20
21.8	221.415	60.938	208.555	0	0.39257	20
21.9	223.11	61.0789	208.064	0	0.390829	20
22	224.809	61.2192	207.65	0	0.389525	20
22.1	226.511	61.359	207.238	0	0.388268	20
22.2	228.217	61.4985	206.827	0	0.387015	20
22.3	229.928	61.6374	206.418	0	0.385765	20
22.4	231.642	61.7759	206.01	0	0.384519	20
22.5	233.36	61.914	205.603	0	0.383278	20
22.6	235.081	62.0517	205.213	0	0.382043	20
22.7	236.807	62.1889	204.851	0	0.380903	20
22.8	238.536	62.3257	204.489	0	0.379795	20
22.9	240.269	62.4621	204.129	0	0.378689	20
23	242.006	62.5981	203.77	0	0.377587	20
23.1	243.747	62.7337	203.412	0	0.376488	20
23.2	245.492	62.8689	203.055	0	0.375392	20
23.3	247.24	63.0038	202.699	0	0.374299	20
23.4	248.992	63.1382	202.344	0	0.373209	20
23.5	250.747	63.2723	201.99	0	0.372122	20
23.6	252.507	63.4059	201.637	0	0.371039	20
23.7	254.27	63.5392	201.285	0	0.369958	20
23.8	256.037	63.6721	200.934	0	0.36888	20
23.9	257.807	63.8046	200.584	0	0.367806	20
24	259.582	63.9367	200.235	0	0.366735	20
24.1	261.359	64.0684	199.887	0	0.365666	20
24.2	263.141	64.1997	199.54	0	0.364601	20
24.3	264.926	64.3307	199.195	0	0.363539	20
24.4	266.715	64.4613	198.85	0	0.36248	20
24.5	268.507	64.5915	198.506	0	0.361423	20
24.6	270.303	64.7213	198.163	0	0.36037	20
24.7	272.103	64.8507	197.821	0	0.35932	20
24.8	273.906	64.9798	197.481	0	0.358273	20
24.9	275.713	65.1085	197.141	0	0.357228	20
25	277.523	65.2368	196.802	0	0.356187	20
25.1	279.337	65.3647	196.464	0	0.355148	20
25.2	281.155	65.4923	196.127	0	0.354113	20
25.3	282.975	65.6195	195.791	0	0.35308	20
25.4	284.8	65.7463	195.456	0	0.35205	20
25.5	286.628	65.8727	195.122	0	0.351024	20
25.6	288.46	65.9988	194.789	0	0.35	20
25.7	290.295	66.1245	194.457	0	0.348979	20
25.8	292.133	66.2499	194.126	0	0.34796	20
25.9	293.975	66.3749	193.795	0	0.346945	20
26	295.821	66.4995	193.466	0	0.345932	20
26.1	297.67	66.6238	193.138	0	0.344922	20
26.2	299.522	66.7476	192.81	0	0.343916	20
26.3	301.378	66.8712	192.484	0	0.342912	20

3530

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

00012897

ALSTOM

26.4	303.237	66.9944	192.159	0	0.34191	20
26.5	305.1	67.1172	191.834	0	0.340912	20
26.6	306.966	67.2396	191.511	0	0.339917	20
26.7	308.835	67.3617	191.188	0	0.338925	20
26.8	310.708	67.4835	190.867	0	0.337936	20
26.9	312.584	67.6048	190.546	0	0.33695	20
27	314.464	67.7259	190.227	0	0.335966	20
27.1	316.347	67.8465	189.908	0	0.334986	20
27.2	318.233	67.9669	189.59	0	0.334008	20
27.3	320.123	68.0869	189.273	0	0.333033	20
27.4	322.016	68.2065	188.958	0	0.33206	20
27.5	323.912	68.3258	188.643	0	0.331091	20
27.6	325.812	68.4447	188.329	0	0.330124	20
27.7	327.715	68.5633	188.015	0	0.32916	20
27.8	329.621	68.6815	187.703	0	0.328199	20
27.9	331.53	68.7994	187.392	0	0.32724	20
28	333.443	68.9169	187.082	0	0.326284	20
28.1	335.359	69.0341	186.772	0	0.325331	20
28.2	337.278	69.151	186.463	0	0.32438	20
28.3	339.201	69.2675	186.155	0	0.323432	20
28.4	341.126	69.3837	185.848	0	0.322487	20
28.5	343.055	69.4995	185.542	0	0.321544	20
28.6	344.987	69.615	185.237	0	0.320604	20
28.7	346.923	69.7302	184.933	0	0.319667	20
28.8	348.861	69.845	184.63	0	0.318733	20
28.9	350.803	69.9595	184.327	0	0.317801	20
29	352.748	70.0736	184.024	0	0.31687	20
29.1	354.696	70.1875	183.721	0	0.315937	20
29.2	356.647	70.3009	183.419	0	0.315007	20
29.3	358.602	70.4141	183.118	0	0.314079	20
29.4	360.559	70.5269	182.817	0	0.313153	20
29.5	362.52	70.6394	182.518	0	0.312231	20
29.6	364.484	70.7515	182.219	0	0.311311	20
29.7	366.45	70.8634	181.922	0	0.310394	20
29.8	368.42	70.9749	181.625	0	0.309479	20
29.9	370.393	71.086	181.329	0	0.308567	20
30	372.37	71.1969	181.034	0	0.307658	20
30.1	374.349	71.3074	180.739	0	0.306751	20
30.2	376.331	71.4176	180.446	0	0.305847	20
30.3	378.317	71.5274	180.154	0	0.304945	20
30.4	380.305	71.637	179.862	0	0.304046	20
30.5	382.296	71.7462	179.571	0	0.30315	20
30.6	384.291	71.8551	179.281	0	0.302256	20
30.7	386.288	71.9636	178.992	0	0.301365	20
30.8	388.289	72.0719	178.704	0	0.300477	20
30.9	390.292	72.1798	178.417	0	0.299591	20
31	392.299	72.2874	178.13	0	0.298707	20
31.1	394.308	72.3947	177.844	0	0.297826	20
31.2	396.321	72.5017	177.56	0	0.296948	20
31.3	398.336	72.6084	177.276	0	0.296072	20
31.4	400.354	72.7147	176.993	0	0.295199	20
31.5	402.376	72.8208	176.71	0	0.294328	20
31.6	404.4	72.9265	176.429	0	0.29346	20
31.7	406.427	73.0319	176.148	0	0.292594	20
31.8	408.457	73.137	175.868	0	0.291731	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012398

31.9	410.49	73.2418	175.589	0	0.29087	20
32	412.526	73.3463	175.311	0	0.290012	20
32.1	414.565	73.4505	175.034	0	0.289156	20
32.2	416.607	73.5543	174.757	0	0.288303	20
32.3	418.652	73.6579	174.481	0	0.287452	20
32.4	420.699	73.7611	174.206	0	0.286603	20
32.5	422.749	73.8641	173.932	0	0.285758	20
32.6	424.803	73.9667	173.659	0	0.284914	20
32.7	426.859	74.0691	173.387	0	0.284073	20
32.8	428.918	74.1711	173.115	0	0.283234	20
32.9	430.979	74.2729	172.844	0	0.282398	20
33	433.044	74.3743	172.574	0	0.281565	20
33.1	435.111	74.4755	172.305	0	2.81E-01	2.00E+01
33.2	437.181	74.5763	172.036	0	2.80E-01	2.00E+01
33.3	439.254	74.6768	171.768	0	2.79E-01	2.00E+01
33.4	441.33	74.7771	171.502	0	2.78E-01	2.00E+01
33.5	443.409	74.877	171.235	0	2.77E-01	2.00E+01
33.6	445.49	74.9762	86.1594	0	2.74E-01	2.00E+01
33.7	447.572	74.9405	0	0	-2.19E-01	2.00E+01
33.8	449.653	74.8618	0	0	-2.19E-01	2.00E+01
33.9	451.731	74.783	0	0	-2.19E-01	2.00E+01
34	453.808	74.7043	0	0	-2.19E-01	2.00E+01
34.1	455.882	74.6256	0	0	-2.19E-01	2.00E+01
34.2	457.954	74.5469	0	0	-2.19E-01	2.00E+01
34.3	460.023	74.4682	0	0	-2.19E-01	2.00E+01
34.4	462.091	74.3896	0	0	-2.19E-01	2.00E+01
34.5	464.156	74.3109	0	0	-2.18E-01	2.00E+01
34.6	466.219	74.2323	0	0	-2.18E-01	2.00E+01
34.7	468.28	74.1537	0	0	-2.18E-01	2.00E+01
34.8	470.339	74.0751	0	0	-2.18E-01	2.00E+01
34.9	472.395	73.9965	0	0	-2.18E-01	2.00E+01
35	474.45	73.9179	0	0	-2.18E-01	2.00E+01
35.1	476.502	73.8393	0	0	-2.18E-01	2.00E+01
35.2	478.552	73.7608	0	0	-2.18E-01	2.00E+01
35.3	480.6	73.6822	0	0	-2.18E-01	2.00E+01
35.4	482.645	73.6037	0	0	-2.18E-01	2.00E+01
35.5	484.689	73.5252	0	0	-2.18E-01	2.00E+01
35.6	486.73	73.4467	0	0	-2.18E-01	2.00E+01
35.7	488.769	73.3682	0	0	-2.18E-01	2.00E+01
35.8	490.806	73.2897	0	0	-2.18E-01	2.00E+01
35.9	492.841	73.2113	0	0	-2.18E-01	2.00E+01
36	494.873	73.1328	0	0	-2.18E-01	2.00E+01
36.1	496.904	73.0544	0	0	-2.18E-01	2.00E+01
36.2	498.932	72.976	0	0	-2.18E-01	2.00E+01
36.3	500.958	72.8976	0	0	-2.18E-01	2.00E+01
36.4	502.982	72.8192	0	0	-2.18E-01	2.00E+01
36.5	505.003	72.7408	0	0	-2.18E-01	2.00E+01
36.6	507.023	72.6625	0	0	-2.18E-01	2.00E+01
36.7	509.04	72.5841	0	0	-2.18E-01	2.00E+01
36.8	511.055	72.5005	-195.019	0	-2.47E-01	2.00E+01
36.9	513.065	72.1289	-345.852	-20.8234	-1.28E+00	2.00E+01
37	515.062	71.6684	-347.986	-18.7666	-1.28E+00	2.00E+01
37.1	517.047	71.208	-350.119	-16.7097	-1.28E+00	2.00E+01
37.2	519.019	70.7476	-352.253	-14.6519	-1.28E+00	2.00E+01
37.3	520.977	70.2871	-354.386	-12.5941	-1.28E+00	2.00E+01

3532

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

00012899



37.4	522.923	69.8267	-356.714	-10.3407	-1.28E+00	2.00E+01
37.5	524.856	69.3663	-359.365	-7.76456	-1.28E+00	2.00E+01
37.6	526.777	68.9058	-362.022	-5.182	-1.28E+00	2.00E+01
37.7	528.684	68.4454	-364.703	-2.57512	-1.28E+00	2.00E+01
37.8	530.579	67.985	-367.335	-1.68E-02	-1.27899	20
37.9	532.461	67.5245	-367.425	0	-1.27899	20
38	534.331	67.0641	-367.498	0	-1.27899	20
38.1	536.187	66.6037	-367.571	0	-1.27899	20
38.2	538.031	66.1432	-367.643	0	-1.27899	20
38.3	539.862	65.6828	-367.715	0	-1.27899	20
38.4	541.68	65.2223	-367.787	0	-1.27899	20
38.5	543.485	64.7619	-367.858	0	-1.27899	20
38.6	545.278	64.3015	-367.929	0	-1.27899	20
38.7	547.058	63.841	-367.999	0	-1.27899	20
38.8	548.825	63.3806	-368.069	0	-1.27899	20
38.9	550.578	62.9202	-368.139	0	-1.27899	20
39	552.32	62.4597	-368.208	0	-1.27899	20
39.1	554.049	61.9993	-368.277	0	-1.27899	20
39.2	555.764	61.5389	-368.346	0	-1.27899	20
39.3	557.467	61.0784	-368.414	0	-1.27899	20
39.4	559.158	60.618	-368.482	0	-1.27899	20
39.5	560.835	60.1576	-368.55	0	-1.27899	20
39.6	562.5	59.6971	-368.617	0	-1.27899	20
39.7	564.152	59.2367	-368.684	0	-1.27899	20
39.8	565.791	58.7763	-368.751	0	-1.27899	20
39.9	567.417	58.3158	-368.817	0	-1.27899	20
40	569.031	57.8554	-368.882	0	-1.27899	20
40.1	570.631	57.3949	-368.948	0	-1.27899	20
40.2	572.219	56.9345	-369.013	0	-1.27899	20
40.3	573.794	56.4741	-369.078	0	-1.27899	20
40.4	575.356	56.0136	-369.142	0	-1.27899	20
40.5	576.906	55.5532	-369.206	0	-1.27899	20
40.6	578.442	55.0928	-369.27	0	-1.27899	20
40.7	579.967	54.6323	-369.333	0	-1.27899	20
40.8	581.478	54.1719	-369.396	0	-1.27899	20
40.9	582.977	53.7115	-369.458	0	-1.27899	20
41	584.462	53.251	-369.52	0	-1.27899	20
41.1	585.935	52.7906	-369.582	0	-1.27899	20
41.2	587.394	52.3302	-369.644	0	-1.27899	20
41.3	588.842	51.8697	-369.705	0	-1.27899	20
41.4	590.276	51.4093	-369.766	0	-1.27899	20
41.5	591.698	50.9488	-369.826	0	-1.27899	20
41.6	593.107	50.4884	-369.849	-3.70E-02	-1.27899	20
41.7	594.502	50.028	-369.849	-9.66E-02	-1.27899	20
41.8	595.886	49.5675	-369.847	-0.158116	-1.27899	20
41.9	597.256	49.1071	-369.844	-0.219382	-1.27899	20
42	598.614	48.6467	-369.844	-0.278297	-1.27899	20
42.1	599.959	48.1862	-369.844	-0.336357	-1.27899	20
42.2	601.291	47.7258	-369.844	-0.39393	-1.27899	20
42.3	602.61	47.2654	-369.844	-0.451305	-1.27899	20
42.4	603.917	46.8049	-369.844	-0.50831	-1.27899	20
42.5	605.211	46.3445	-369.845	-0.565166	-1.27899	20
42.6	606.491	45.8841	-369.845	-0.621522	-1.27899	20
42.7	607.76	45.4236	-369.845	-0.677743	-1.27899	20
42.8	609.016	44.9632	-369.845	-0.733138	-1.27899	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012300

42.9	610.258	44.5027	-369.845	-0.788483	-1.27899	20
43	611.487	44.0423	-369.845	-0.843452	-1.27899	20
43.1	612.704	43.5819	-369.845	-0.898044	-1.27899	20
43.2	613.909	43.1214	-369.845	-0.952097	-1.27899	20
43.3	615.1	42.661	-369.845	-1.00579	-1.27899	20
43.4	616.279	42.2006	-369.845	-1.05919	-1.27899	20
43.5	617.444	41.7401	-369.845	-1.11212	-1.27899	20
43.6	618.597	41.2797	-369.845	-1.16482	-1.27899	20
43.7	619.738	40.8193	-369.845	-1.21719	-1.27899	20
43.8	620.866	40.3588	-369.845	-1.26936	-1.27899	20
43.9	621.981	39.8984	-369.846	-1.32103	-1.27899	20
44	623.082	39.438	-369.846	-1.3725	-1.27899	20
44.1	624.171	38.9775	-369.846	-1.42313	-1.27899	20
44.2	625.247	38.5171	-369.846	-1.47379	-1.27899	20
44.3	626.31	38.0567	-369.846	-1.52404	-1.27899	20
44.4	627.361	37.5962	-369.846	-1.57389	-1.27899	20
44.5	628.399	37.1358	-369.846	-1.6233	-1.27899	20
44.6	629.424	36.6753	-369.846	-1.67225	-1.27899	20
44.7	630.436	36.2149	-369.846	-1.72087	-1.27899	20
44.8	631.436	35.7545	-369.846	-1.76909	-1.27899	20
44.9	632.423	35.294	-369.847	-1.81704	-1.27899	20
45	633.397	34.8336	-369.845	-1.86661	-1.27899	20
45.1	634.358	34.3732	-369.839	-1.91941	-1.27899	20
45.2	635.306	33.9127	-369.835	-1.97075	-1.27899	20
45.3	636.242	33.4523	-369.836	-2.01732	-1.27899	20
45.4	637.165	32.9919	-369.836	-2.06315	-1.27899	20
45.5	638.076	32.5314	-369.843	-2.10218	-1.27899	20
45.6	638.973	32.071	-369.85	-2.14059	-1.27899	20
45.7	639.857	31.6106	-369.851	-2.18486	-1.27899	20
45.8	640.728	31.1501	-369.851	-2.22942	-1.27899	20
45.9	641.586	30.6897	-369.851	-2.27376	-1.27899	20
46	642.432	30.2292	-369.851	-2.31777	-1.27899	20
46.1	643.266	29.7688	-369.851	-2.36141	-1.27899	20
46.2	644.088	29.3084	-369.851	-2.40487	-1.27899	20
46.3	644.895	28.8479	-369.851	-2.44797	-1.27899	20
46.4	645.689	28.3875	-369.851	-2.49068	-1.27899	20
46.5	646.471	27.9271	-369.851	-2.53318	-1.27899	20
46.6	647.241	27.4666	-369.851	-2.5753	-1.27899	20
46.7	647.999	27.0062	-369.851	-2.6168	-1.27899	20
46.8	648.741	26.5458	-369.851	-2.65802	-1.27899	20
46.9	649.471	26.0853	-369.851	-2.69896	-1.27899	20
47	650.19	25.6249	-369.851	-2.73959	-1.27899	20
47.1	650.896	25.1645	-369.852	-2.77982	-1.27899	20
47.2	651.587	24.704	-369.852	-2.81969	-1.27899	20
47.3	652.267	24.2436	-369.852	-2.85927	-1.27899	20
47.4	652.936	23.7832	-369.852	-2.89854	-1.27899	20
47.5	653.588	23.3227	-369.852	-2.93699	-1.27899	20
47.6	654.23	22.8623	-369.852	-2.97517	-1.27899	20
47.7	654.86	22.4018	-369.852	-3.01302	-1.27899	20
47.8	655.473	21.9414	-369.852	-3.05048	-1.27899	20
47.9	656.079	21.481	-369.852	-3.08778	-1.27899	20
48	656.667	21.0205	-369.852	-3.12467	-1.27899	20
48.1	657.245	20.5601	-369.852	-3.16131	-1.27899	20
48.2	657.81	20.0997	-369.852	-3.1976	-1.27899	20
48.3	658.36	19.6392	-369.852	-3.23348	-1.27899	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

00012301

ALSTOM

48.4	658.902	19.1788	-369.852	-3.26916	-1.27899	20
48.5	659.425	18.7184	-369.852	-3.30421	-1.27899	20
48.6	659.943	18.2579	-369.852	-3.33913	-1.27899	20
48.7	660.438	17.7975	-369.852	-3.37328	-1.27899	20
48.8	660.931	17.3371	-369.852	-3.40734	-1.27899	20
48.9	661.401	16.8766	-369.852	-3.4408	-1.27899	20
49	661.867	16.4162	-369.852	-3.47417	-1.27899	20
49.1	662.313	15.9558	-369.852	-3.50717	-1.27899	20
49.2	662.75	15.4953	-369.852	-3.54002	-1.27899	20
49.3	663.175	15.0349	-369.852	-3.57232	-1.27899	20
49.4	663.583	14.5744	-369.852	-3.60389	-1.27899	20
49.5	663.99	14.114	-369.852	-3.63547	-1.27899	20
49.6	664.366	13.6536	-369.852	-3.66638	-1.27899	20
49.7	664.74	13.1931	-369.852	-3.69728	-1.27899	20
49.8	665.104	12.7327	-369.852	-3.72789	-1.27899	20
49.9	665.443	12.2723	-369.852	-3.75783	-1.27899	20
50	665.781	11.8118	-369.852	-3.78777	-1.27899	20
50.1	666.106	11.3514	-369.852	-3.81717	-1.27899	20
50.2	666.404	10.891	-369.852	-3.84561	-1.27899	20
50.3	666.703	10.4305	-369.852	-3.87404	-1.27899	20
50.4	667.001	9.9701	-367.687	-6.06783	-1.27899	20
50.5	667.252	9.50966	-334.346	-39.434	-1.27899	20
50.6	667.504	9.04923	-301.006	-72.8001	-1.27899	20
50.7	667.756	8.58879	-266.99	-106.842	-1.27899	20
50.8	668.005	8.12836	-232.893	-140.963	-1.27898	20
50.9	668.198	7.66793	-198.797	-175.036	-1.27898	20
51	668.392	7.2075	-164.701	-209.11	-1.27898	20
51.1	668.585	6.74707	-1.31E+02	-243.183	-1.27897	20
51.2	668.778	6.28665	-9.65E+01	-277.257	-1.27897	20
51.3	668.971	5.82622	-6.24E+01	-311.33	-1.27897	20
51.4	669.068	5.36601	-2.83E+01	-345.406	-1.27892	20
51.5	669.148	4.90585	-1.11E+00	-372.626	-1.27886	20
51.6	669.228	4.44568	-5.47E-01	-373.191	-1.2788	20
51.7	669.308	3.98552	9.03E-06	-373.738	-1.27874	20
51.8	669.388	3.52535	3.65E-05	-373.738	-1.27868	20
51.9	669.467	3.06519	6.40E-05	-373.738	-1.27862	20
52	669.547	2.60502	1.16E-04	-373.738	-1.27857	20
52.1	669.627	2.14486	1.71E-04	-373.738	-1.27851	20
52.2	669.707	1.6847	3.04E-04	-373.738	-1.27845	20
52.3	669.787	1.22453	4.72E-04	-373.738	-1.27839	20
52.4	669.867	0.764366	4.24E-04	-373.738	-1.27833	20
52.5	669.947	0.304201	1.69E-04	-373.738	-1.27827	20
52.6	670	0	0	0	0	20
52.7	670	0	0	0	0	20
52.8	670	0	0	0	0	20
52.9	670	0	0	0	0	20
53	670	0	0	0	0	20
53.1	670	0	0.00E+00	0	0	20
53.2	670	0	0.00E+00	0	0	20
53.3	670	0	0.00E+00	0	0	20
53.4	670	0	0.00E+00	0	0	20
53.5	670	0	0.00E+00	0	0	20
53.6	670	0	0.00E+00	0	0	20
53.7	670	0	0.00E+00	0	0	20
53.8	670	0.00E+00	0.00E+00	0	0	20

3595

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012902

53.9	670	0	0	0	0	20
54	670	0	0.00E+00	0	0	20
54.1	670	0	0.00E+00	0	0	20
54.2	670	0	0.00E+00	0	0	20
54.3	670	0	0.00E+00	0	0	20
54.4	670	0	0.00E+00	0	0	20
54.5	670	0	0.00E+00	0	0	20
54.6	670	0	0.00E+00	0	0	20
54.7	670	0	0.00E+00	0	0	20
54.8	670	0	0.00E+00	0	0	20
54.9	670	0	0.00E+00	0	0	20
55	670	0	0.00E+00	0	0	20
55.1	670	0	0.00E+00	0	0	20
55.2	670	0	0.00E+00	0	0	20
55.3	670	0	0.00E+00	0	0	20
55.4	670	0	0.00E+00	0	0	20
55.5	670	0	0.00E+00	0	0	20
55.6	670	0	0.00E+00	0	0	20
55.7	670	0	0.00E+00	0	0	20
55.8	670	0	0.00E+00	0	0	20
55.9	670	0	0.00E+00	0	0	20
56	670	0	0.00E+00	0	0	20
56.1	670	0	0.00E+00	0	0	20
56.2	670	0	0.00E+00	0	0	20
56.3	670	0	0.00E+00	0	0	20
56.4	670	0	0.00E+00	0	0	20
56.5	670	0	0.00E+00	0	0	20
56.6	670	0	0.00E+00	0	0	20
56.7	670	0	0.00E+00	0	0	20
56.8	670	0	0.00E+00	0	0	20
56.9	670	0	0.00E+00	0	0	20
57	670	0	0.00E+00	0	0	20
57.1	670	0	0.00E+00	0	0	20
57.2	670	0	0.00E+00	0	0	20
57.3	670	0	0.00E+00	0	0	20
57.4	670	0.00E+00	0.00E+00	0	0	20
57.5	670	0	0	0	0	20
57.6	670	0	0	0	0	20
57.7	670	0	0	0	0	20
57.8	670	0	0	0	0	20
57.9	670	0	0	0	0	20
58	670	0	0	0	0	20
58.1	670	0	0	0	0	20
58.2	670	0	0	0	0	20
58.3	670	0	0	0	0	20
58.4	670	0	0	0	0	20
58.5	670	0	0	0	0	20
58.6	670	0	0	0	0	20
58.7	670	0	0	0	0	20
58.8	670	0	0	0	0	20
58.9	670	0	0	0	0	20
59	670	0	0	0	0	20
59.1	670	0	0	0	0	20
59.2	670	0	0	0	0	20
59.3	670	0	0	0	0	20

3596

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

00012903



59.4	670	0	0	0	0	20
59.5	670	0	0	0	0	20
59.6	670	0	0	0	0	20
59.7	670	0	0	0	0	20
59.8	670	0	0	0	0	20
59.9	670	0	0	0	0	20
60	670	0	0	0	0	20
60.1	670	0	0	0	0	20
60.2	670	0	0	0	0	20
60.3	670	0	0	0	0	20
60.4	670	0	0	0	0	20
60.5	670	0	0	0	0	20
60.6	670	0	0	0	0	20
60.7	670	0	0	0	0	20
60.8	670	0	0	0	0	20
60.9	670	0	0	0	0	20
61	670	0	0	0	0	20
61.1	670	0	0	0	0	20
61.2	670	0	0	0	0	20
61.3	670	0	0	0	0	20
61.4	670	0	0	0	0	20
61.5	670	0	0	0	0	20
61.6	670	0	0	0	0	20
61.7	670	0	0	0	0	20
61.8	670	0	0	0	0	20
61.9	670	0	0	0	0	20
62	670	0	0	0	0	20
62.1	670	0	0	0	0	20
62.2	670	0	0	0	0	20
62.3	670	0	0	0	0	20
62.4	670	0	0	0	0	20
62.5	670	0	0	0	0	20
62.6	670	0	0	0	0	20
62.7	670	0	0	0	0	20
62.8	670	0	0	0	0	20
62.9	670	0	0	0	0	20
63	670	0	0	0	0	20
63.1	670	0	0	0	0	20
63.2	670	0	0	0	0	20
63.3	670	0	0	0	0	20
63.4	670	0	0	0	0	20
63.5	670	0	0	0	0	20
63.6	670	0	0	0	0	20
63.7	670	0	0	0	0	20
63.8	670	0	0	0	0	20
63.9	670	0	0	0	0	20
64	670	0	0	0	0	20
64.1	670	0	0	0	0	20
64.2	670	0	0	0	0	20
64.3	670	0	0	0	0	20
64.4	670	0	0	0	0	20
64.5	670	0	0	0	0	20
64.6	670	0	0	0	0	20
64.7	670	0	0	0	0	20
64.8	670	0	0	0	0	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012304

64.9	670	0	0	0	0	20
65	670	0	0	0	0	20
65.1	670	0	0	0	0	20
65.2	670	0	0	0	0	20
65.3	670	0	0	0	0	20
65.4	670	0	0	0	0	20
65.5	670	0	0	0	0	20
65.6	670	0	0	0	0	20
65.7	670	0	0	0	0	20
65.8	670	0	0	0	0	20
65.9	670	0	0	0	0	20
66	670	0	0	0	0	20
66.1	670	0	0	0	0	20
66.2	670	0	0	0	0	20
66.3	670	0	0	0	0	20
66.4	670	0	0	0	0	20
66.5	670	0	0	0	0	20
66.6	670	0	0	0	0	20
66.7	670	0	0	0	0	20
66.8	670	0	0	0	0	20
66.9	670	0	0	0	0	20
67	670	0	0	0	0	20
67.1	670	0	0	0	0	20
67.2	670	0	0	0	0	20
67.3	670	0	0	0	0	20
67.4	670	0	0	0	0	20
67.5	670	0	0	0	0	20
67.6	670	0	0	0	0	20
67.7	670	0	0	0	0	20
67.8	670	0	0	0	0	20
67.9	670	0	0	0	0	20
68	670	0	0	0	0	20
68.1	670	0	0	0	0	20
68.2	670	0	0	0	0	20
68.3	670	0	0	0	0	20
68.4	670	0	0	0	0	20
68.5	670	0	0	0	0	20
68.6	670	0	0	0	0	20
68.7	670	0	0	0	0	20
68.8	670	0	0	0	0	20
68.9	670	0	0	0	0	20
69	670	0	0	0	0	20
69.1	670	0	0	0	0	20
69.2	670	0	0	0	0	20
69.3	670	0	0	0	0	20
69.4	670	0	0	0	0	20
69.5	670	0	0	0	0	20
69.6	670	0	0	0	0	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012305

Cycle B2

7C 5M AW2 6p/m²

Max acceleration

1.05 m/s²

Max Speed

74.99 Km/h

Stop Time

17.0 s

Cycle time

56.4 s

Total Distance

725 m

time(s)	distance(m)	speed(km/h)	F_elec(kN)	F_brakeP(kN)	gamma(m/s2)	gradient(0/00)
0	0	0	397.182	0	1.05443	0
0.1	7.26E-02	0.379596	397.182	0	1.05E+00	0.00E+00
0.2	0.145219	0.759192	397.182	0	1.05443	0
0.3	0.217829	1.13879	397.182	0	1.05443	0
0.4	0.290439	1.51838	397.182	0	1.05443	0
0.5	0.363048	1.89798	397.182	0	1.05443	0
0.6	0.435658	2.27757	397.182	0	1.05443	0
0.7	0.508268	2.65717	397.182	0	1.05443	0
0.8	0.580877	3.03677	397.182	0	1.05443	0
0.9	0.653487	3.41636	397.182	0	1.05443	0
1	0.726097	3.79596	397.182	0	1.05443	0
1.1	0.798706	4.17555	397.182	0	1.05443	0
1.2	0.871316	4.55515	397.182	0	1.05443	0
1.3	0.943926	4.93475	397.182	0	1.05443	0
1.4	1.03992	5.31428	397.181	0	1.0544	0
1.5	1.21519	5.69361	397.181	0	1.05427	0
1.6	1.39047	6.07294	397.181	0	1.05415	0
1.7	1.56575	6.45227	397.181	0	1.05402	0
1.8	1.74103	6.83161	397.181	0	1.05389	0
1.9	1.9163	7.21094	397.181	0	1.05376	0
2	2.11933	7.5902	397.181	0	1.05366	0
2.1	2.34773	7.96941	397.181	0	1.05358	0
2.2	2.57612	8.34862	397.181	0	1.0535	0
2.3	2.80452	8.72783	397.181	0	1.05342	0
2.4	3.03904	9.10702	397.181	0	1.05335	0
2.5	3.30993	9.48613	397.181	0	1.05327	0
2.6	3.58082	9.86524	397.181	0	1.0532	0
2.7	3.85172	10.2444	397.181	0	1.05312	0
2.8	4.13916	10.6234	397.181	0	1.05305	0
2.9	4.44661	11.0024	397.181	0	1.05297	0
3	4.75406	11.3815	397.181	0	1.0529	0
3.1	5.06803	11.7605	397.181	0	1.05282	0
3.2	5.40808	12.1394	397.181	0	1.05275	0
3.3	5.74814	12.5184	397.181	0	1.05267	0
3.4	6.09589	12.8973	397.181	0	1.0526	0
3.5	6.46565	13.2761	397.181	0	1.05252	0
3.6	6.83541	13.655	397.181	0	1.05244	0
3.7	7.22041	14.0338	397.181	0	1.05237	0
3.8	7.61765	14.4126	397.181	0	1.05229	0
3.9	8.01585	14.7914	397.181	0	1.05221	0
4	8.43876	15.1702	397.181	0	1.05214	0
4.1	8.86168	15.5489	397.181	0	1.05206	0
4.2	9.30088	15.9276	397.181	0	1.05198	0
4.3	9.748	16.3063	397.181	0	1.0519	0

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012906

4.4	10.2051	16.6849	397.181	0	1.05182	0
4.5	10.6752	17.0635	397.181	0	1.05174	0
4.6	11.152	17.4421	397.181	0	1.05166	0
4.7	11.644	17.8206	397.181	0	1.05158	0
4.8	12.1417	18.1992	397.181	0	1.05149	0
4.9	12.6546	18.5776	397.181	0	1.05141	0
5	13.174	18.9561	397.181	0	1.05133	0
5.1	13.707	19.3345	397.181	0	1.05124	0
5.2	14.2487	19.713	397.181	0	1.05116	0
5.3	14.8011	20.0913	397.181	0	1.05107	0
5.4	15.3654	20.4697	397.181	0	1.05099	0
5.5	15.9365	20.848	397.181	0	1.0509	0
5.6	16.5237	21.2263	397.181	0	1.05082	0
5.7	17.1162	21.6045	397.181	0	1.05073	0
5.8	17.723	21.9827	397.181	0	1.05064	0
5.9	18.3391	22.3609	397.181	0	1.05055	0
6	18.9629	22.7391	397.181	0	1.05046	0
6.1	19.6024	23.1172	397.181	0	1.05037	0
6.2	20.2485	23.4707	397.181	0	1.05051	20
6.3	20.9038	23.7839	397.181	0	0.887347	20
6.4	21.5703	24.0971	397.181	0	0.869931	20
6.5	22.2433	24.4102	397.181	0	0.869856	20
6.6	22.9247	24.7233	397.181	0	0.869779	20
6.7	23.6173	25.0364	397.183	0	0.869703	20
6.8	24.3168	25.3495	397.186	0	0.869628	20
6.9	25.0236	25.6625	397.192	0	0.869558	20
7	25.7422	25.9755	397.196	0	0.869495	20
7.1	26.4686	26.2885	397.198	0	0.869429	20
7.2	27.2024	26.6015	397.199	0	0.869359	20
7.3	27.9448	26.9144	397.199	0	0.869282	20
7.4	28.698	27.2273	397.197	0	0.869203	20
7.5	29.4589	27.5402	397.195	0	0.86912	20
7.6	30.2276	27.8531	397.192	0	0.869033	20
7.7	31.0044	28.1659	397.191	0	0.868945	20
7.8	31.7923	28.4787	397.191	0	0.868859	20
7.9	32.5882	28.7914	397.191	0	0.868777	20
8	33.3922	29.1041	397.192	0	0.868696	20
8.1	34.2045	29.4168	397.192	0	0.868614	20
8.2	35.0251	29.7295	397.192	0	0.868531	20
8.3	35.8559	30.0421	397.192	0	0.868448	20
8.4	36.6952	30.3548	397.192	0	0.868365	20
8.5	37.543	30.6673	397.193	0	0.868281	20
8.6	38.3991	30.9799	397.193	0	0.868197	20
8.7	39.2637	31.2924	397.192	0	0.868112	20
8.8	40.1368	31.6049	397.19	0	0.868024	20
8.9	41.0185	31.9173	397.188	0	0.867934	20
9	41.9098	32.2298	397.188	0	0.867842	20
9.1	42.8098	32.5421	397.188	0	0.867754	20
9.2	43.7183	32.8545	397.188	0	0.867667	20
9.3	44.6354	33.1668	397.188	0	0.867579	20
9.4	45.5611	33.4791	397.188	0	0.867491	20
9.5	46.4954	33.7914	397.189	0	0.867403	20
9.6	47.4383	34.1036	396.299	0	0.867314	20
9.7	48.3899	34.415	394.27	0	0.865093	20
9.8	49.3501	34.7244	392.094	0	0.859516	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012907

9.9	50.3189	35.0317	389.498	0	0.853509	20
10	51.2961	35.3364	385.916	0	0.846453	20
10.1	52.2819	35.6376	382.118	0	0.836644	20
10.2	53.2759	35.935	378.368	0	0.826236	20
10.3	54.2782	36.2288	374.665	0	0.815961	20
10.4	55.2885	36.5189	371.007	0	0.805817	20
10.5	56.307	36.8054	367.395	0	0.795801	20
10.6	57.3333	37.0883	363.828	0	0.785912	20
10.7	58.3674	37.3678	360.304	0	0.776148	20
10.8	59.4093	37.6438	356.825	0	0.766507	20
10.9	60.4587	37.9164	353.388	0	0.756988	20
11	61.5157	38.1856	349.994	0	0.747588	20
11.1	62.5801	38.4515	346.641	0	0.738307	20
11.2	63.6518	38.7142	343.33	0	0.729141	20
11.3	64.7307	38.9735	340.059	0	0.72009	20
11.4	65.8167	39.2298	336.829	0	0.711153	20
11.5	66.9097	39.4828	333.639	0	0.702327	20
11.6	68.0097	39.7328	330.488	0	0.693611	20
11.7	69.1171	39.9794	327.378	0	0.685013	20
11.8	70.2312	40.2248	324.284	0	0.682175	20
11.9	71.3522	40.4741	321.141	0	0.692038	20
12	72.4799	40.7198	318.044	0	0.682008	20
12.1	73.6143	40.962	315.076	0	0.672092	20
12.2	74.7554	41.2008	312.619	0	0.662574	20
12.3	75.9029	41.4367	310.396	0	0.654585	20
12.4	77.057	41.6699	308.2	0	0.647017	20
12.5	78.218	41.9001	306.072	0	0.639515	20
12.6	79.3852	42.1279	304.342	0	0.632273	20
12.7	80.5586	42.3535	303.023	0	0.626245	20
12.8	81.738	42.5772	301.714	0	0.621088	20
12.9	82.9236	42.7992	300.416	0	0.615952	20
13	84.1155	43.0192	299.129	0	0.610839	20
13.1	85.3138	43.2374	297.853	0	0.605749	20
13.2	86.5179	43.4538	296.588	0	0.600681	20
13.3	87.7278	43.6684	295.333	0	0.595633	20
13.4	88.9435	43.8813	294.088	0	0.590607	20
13.5	90.1655	44.0922	292.854	0	0.585817	20
13.6	91.3934	44.302	291.628	0	0.582414	20
13.7	92.6269	44.5106	290.408	0	0.579029	20
13.8	93.866	44.718	289.195	0	0.575664	20
13.9	95.111	44.9241	287.989	0	0.572319	20
14	96.3619	45.129	286.791	0	0.568995	20
14.1	97.6184	45.3328	285.599	0	0.565689	20
14.2	98.8802	45.5354	284.414	0	0.562401	20
14.3	100.148	45.7368	283.236	0	0.559133	20
14.4	101.421	45.937	282.065	0	0.555885	20
14.5	102.7	46.1361	280.901	0	0.552654	20
14.6	103.984	46.3341	279.743	0	0.549442	20
14.7	105.274	46.5308	278.593	0	0.546251	20
14.8	106.569	46.7265	277.449	0	0.543077	20
14.9	107.87	46.921	276.311	0	0.539921	20
15	109.176	47.1144	275.18	0	0.536784	20
15.1	110.488	47.3066	274.056	0	0.533666	20
15.2	111.804	47.4978	272.938	0	0.530565	20
15.3	113.126	47.6878	271.827	0	0.527482	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

00012908

ALSTOM

15.4	114.454	47.8767	270.722	0	0.524418	20
15.5	115.786	48.0645	269.624	0	0.52137	20
15.6	117.124	48.2513	268.531	0	0.51834	20
15.7	118.467	48.4369	267.446	0	0.515329	20
15.8	119.815	48.6215	266.366	0	0.512335	20
15.9	121.168	48.805	265.293	0	0.509358	20
16	122.526	48.9875	264.226	0	0.506398	20
16.1	123.889	49.1689	263.165	0	0.503455	20
16.2	125.258	49.3492	262.111	0	0.50053	20
16.3	126.631	49.5285	261.062	0	0.497622	20
16.4	128.009	49.7068	260.02	0	0.49473	20
16.5	129.392	49.8839	258.984	0	0.491856	20
16.6	130.78	50.0601	257.953	0	0.488997	20
16.7	132.173	50.2353	256.929	0	0.486156	20
16.8	133.571	50.4094	255.911	0	0.483331	20
16.9	134.974	50.5826	254.898	0	0.480522	20
17	136.382	50.7547	253.891	0	0.47773	20
17.1	137.794	50.9258	252.891	0	0.474954	20
17.2	139.211	51.096	251.896	0	0.472193	20
17.3	140.632	51.2651	250.907	0	0.46945	20
17.4	142.059	51.4333	249.923	0	0.466721	20
17.5	143.49	51.6004	248.945	0	0.464009	20
17.6	144.925	51.7667	247.973	0	0.461312	20
17.7	146.366	51.9319	247.008	0	0.458631	20
17.8	147.81	52.0962	246.133	0	0.455974	20
17.9	149.26	52.2597	245.326	0	0.453676	20
18	150.714	52.4223	244.523	0	0.45144	20
18.1	152.172	52.5842	243.724	0	0.449215	20
18.2	153.635	52.7452	242.929	0	0.447001	20
18.3	155.102	52.9055	242.138	0	0.444797	20
18.4	156.574	53.0649	241.4	0	0.442608	20
18.5	158.05	53.2237	240.737	0	0.440663	20
18.6	159.531	53.3817	240.078	0	0.438818	20
18.7	161.016	53.5392	239.421	0	0.436981	20
18.8	162.506	53.6959	238.767	0	0.435152	20
18.9	163.999	53.8521	238.116	0	0.43333	20
19	165.497	54.0075	237.468	0	0.431516	20
19.1	167	54.1623	236.822	0	0.429709	20
19.2	168.506	54.3165	236.179	0	0.427911	20
19.3	170.017	54.47	235.538	0	0.426119	20
19.4	171.532	54.6228	234.901	0	0.424335	20
19.5	173.052	54.7751	234.265	0	0.422557	20
19.6	174.576	54.9267	233.633	0	0.420788	20
19.7	176.103	55.0776	233.003	0	0.419026	20
19.8	177.635	55.2279	232.376	0	0.417271	20
19.9	179.171	55.3777	231.751	0	0.415523	20
20	180.712	55.5267	231.13	0	0.413783	20
20.1	182.256	55.6752	230.51	0	0.41205	20
20.2	183.805	55.823	229.893	0	0.410324	20
20.3	185.358	55.9702	229.279	0	0.408605	20
20.4	186.914	56.1168	228.668	0	0.406893	20
20.5	188.475	56.2628	228.059	0	0.405189	20
20.6	190.04	56.4082	227.452	0	0.403491	20
20.7	191.609	56.5529	226.848	0	0.401801	20
20.8	193.182	56.6971	226.247	0	0.400118	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012909

20.9	194.759	56.8406	225.648	0	0.398441	20
21	196.34	56.9835	225.052	0	0.396772	20
21.1	197.924	57.1259	224.458	0	0.39511	20
21.2	199.513	57.2676	223.867	0	0.393454	20
21.3	201.106	57.4088	223.278	0	0.391805	20
21.4	202.703	57.5494	222.691	0	0.390164	20
21.5	204.303	57.6894	222.107	0	0.388529	20
21.6	205.908	57.8288	221.526	0	0.3869	20
21.7	207.516	57.9676	220.947	0	0.385279	20
21.8	209.128	58.1058	220.37	0	0.383664	20
21.9	210.744	58.2434	219.796	0	0.382056	20
22	212.364	58.3805	219.224	0	0.380455	20
22.1	213.987	58.517	218.655	0	0.37886	20
22.2	215.615	58.6529	218.088	0	0.377272	20
22.3	217.246	58.7883	217.523	0	0.375691	20
22.4	218.881	58.9231	216.961	0	0.374116	20
22.5	220.519	59.0573	216.401	0	0.372548	20
22.6	222.162	59.191	215.843	0	0.370986	20
22.7	223.808	59.3241	215.288	0	0.36943	20
22.8	225.458	59.4566	214.735	0	0.367881	20
22.9	227.111	59.5886	214.184	0	0.366339	20
23	228.768	59.7201	213.636	0	0.364803	20
23.1	230.429	59.851	213.09	0	0.363273	20
23.2	232.093	59.9813	212.546	0	0.36175	20
23.3	233.761	60.1111	212.005	0	0.360233	20
23.4	235.433	60.2403	211.465	0	0.358722	20
23.5	237.108	60.3691	210.928	0	0.357218	20
23.6	238.786	60.4972	210.394	0	0.35572	20
23.7	240.469	60.6248	209.861	0	0.354228	20
23.8	242.154	60.752	209.331	0	0.352742	20
23.9	243.844	60.8785	208.803	0	0.351263	20
24	245.537	61.0045	208.303	0	0.349789	20
24.1	247.233	61.1301	207.913	0	0.348507	20
24.2	248.933	61.2553	207.544	0	0.347459	20
24.3	250.636	61.38	207.176	0	0.346414	20
24.4	252.343	61.5045	206.81	0	0.345372	20
24.5	254.053	61.6285	206.444	0	0.344333	20
24.6	255.766	61.7522	206.08	0	0.343298	20
24.7	257.484	61.8754	205.716	0	0.342265	20
24.8	259.204	61.9984	205.357	0	0.341235	20
24.9	260.928	62.1209	205.03	0	0.340251	20
25	262.655	62.2432	204.707	0	0.339327	20
25.1	264.386	62.3651	204.385	0	0.338407	20
25.2	266.12	62.4866	204.064	0	0.337489	20
25.3	267.857	62.6079	203.744	0	0.336574	20
25.4	269.598	62.7288	203.425	0	0.335661	20
25.5	271.342	62.8493	203.106	0	0.334751	20
25.6	273.09	62.9696	202.789	0	0.333843	20
25.7	274.84	63.0895	202.472	0	0.332937	20
25.8	276.595	63.2091	202.156	0	0.332034	20
25.9	278.352	63.3284	201.841	0	0.331133	20
26	280.113	63.4474	201.527	0	0.330235	20
26.1	281.877	63.566	201.214	0	0.329338	20
26.2	283.644	63.6843	200.902	0	0.328445	20
26.3	285.415	63.8023	200.59	0	0.327553	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012310

26.4	287.189	63.92	200.279	0	0.326664	20
26.5	288.966	64.0373	199.969	0	0.325778	20
26.6	290.747	64.1543	199.66	0	0.324894	20
26.7	292.53	64.2711	199.352	0	0.324012	20
26.8	294.317	64.3875	199.045	0	0.323132	20
26.9	296.107	64.5035	198.738	0	0.322255	20
27	297.901	64.6193	198.432	0	0.32138	20
27.1	299.697	64.7348	198.128	0	0.320507	20
27.2	301.497	64.8499	197.824	0	0.319637	20
27.3	303.3	64.9647	197.52	0	0.318769	20
27.4	305.106	65.0792	197.218	0	0.317903	20
27.5	306.915	65.1934	196.916	0	0.31704	20
27.6	308.728	65.3073	196.615	0	0.316179	20
27.7	310.544	65.4209	196.316	0	0.31532	20
27.8	312.363	65.5342	196.016	0	0.314463	20
27.9	314.184	65.6472	195.718	0	0.313608	20
28	316.009	65.7598	195.42	0	0.312756	20
28.1	317.838	65.8722	195.124	0	0.311907	20
28.2	319.669	65.9842	194.828	0	0.311059	20
28.3	321.504	66.096	194.532	0	0.310213	20
28.4	323.341	66.2074	194.238	0	0.30937	20
28.5	325.182	66.3186	193.944	0	0.308529	20
28.6	327.025	66.4294	193.651	0	0.30769	20
28.7	328.872	66.5399	193.359	0	0.306853	20
28.8	330.722	66.6502	193.068	0	0.306018	20
28.9	332.575	66.7601	192.778	0	0.305186	20
29	334.431	66.8697	192.488	0	0.304356	20
29.1	336.29	66.9791	192.199	0	0.303528	20
29.2	338.152	67.0881	191.911	0	0.302702	20
29.3	340.017	67.1969	191.624	0	0.301879	20
29.4	341.885	67.3053	191.337	0	0.301058	20
29.5	343.756	67.4135	191.052	0	0.30024	20
29.6	345.63	67.5213	190.767	0	0.299423	20
29.7	347.508	67.6289	190.483	0	0.298609	20
29.8	349.388	67.7362	190.2	0	0.297797	20
29.9	351.271	67.8432	189.917	0	0.296987	20
30	353.157	67.9499	189.635	0	0.296179	20
30.1	355.046	68.0563	189.354	0	0.295373	20
30.2	356.938	68.1624	189.074	0	0.29457	20
30.3	358.832	68.2682	188.795	0	0.293768	20
30.4	360.73	68.3737	188.516	0	0.292969	20
30.5	362.631	68.479	188.238	0	0.292172	20
30.6	364.535	68.5839	187.961	0	0.291377	20
30.7	366.441	68.6886	187.684	0	0.290584	20
30.8	368.351	68.793	187.409	0	0.289794	20
30.9	370.263	68.8971	187.134	0	0.289005	20
31	372.178	69.001	186.86	0	0.288218	20
31.1	374.096	69.1045	186.586	0	0.287434	20
31.2	376.017	69.2078	186.313	0	0.286651	20
31.3	377.941	69.3107	186.041	0	0.28587	20
31.4	379.868	69.4134	185.77	0	0.285092	20
31.5	381.798	69.5159	185.499	0	0.284315	20
31.6	383.73	69.618	185.229	0	0.283541	20
31.7	385.665	69.7199	184.96	0	0.282769	20
31.8	387.603	69.8214	184.692	0	0.281998	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

00012311



31.9	389.544	69.9228	184.424	0	0.28123	20
32	391.488	70.0238	184.157	0	0.280464	20
32.1	393.434	70.1246	183.889	0	0.279696	20
32.2	395.384	70.225	183.621	0	0.278928	20
32.3	397.336	70.3252	183.354	0	0.278163	20
32.4	399.291	70.4252	183.088	0	0.277399	20
32.5	401.248	70.5248	182.823	0	0.276638	20
32.6	403.209	70.6242	182.558	0	0.275878	20
32.7	405.172	70.7233	182.294	0	0.275121	20
32.8	407.138	70.8222	182.031	0	0.274366	20
32.9	409.106	70.9207	181.769	0	0.273612	20
33	411.078	71.019	181.507	0	0.272861	20
33.1	413.052	71.1171	181.246	0	2.72E-01	2.00E+01
33.2	415.029	71.2148	180.986	0	2.71E-01	2.00E+01
33.3	417.008	71.3123	180.726	0	2.71E-01	2.00E+01
33.4	418.99	71.4095	180.467	0	2.70E-01	2.00E+01
33.5	420.975	71.5065	180.209	0	2.69E-01	2.00E+01
33.6	422.963	71.6032	179.952	0	2.68E-01	2.00E+01
33.7	424.953	71.6996	179.695	0	2.68E-01	2.00E+01
33.8	426.946	71.7957	179.439	0	2.67E-01	2.00E+01
33.9	428.942	71.8916	179.184	0	2.66E-01	2.00E+01
34	430.94	71.9873	178.929	0	2.65E-01	2.00E+01
34.1	432.941	72.0826	178.675	0	2.65E-01	2.00E+01
34.2	434.945	72.1777	178.422	0	2.64E-01	2.00E+01
34.3	436.951	72.2726	178.17	0	2.63E-01	2.00E+01
34.4	438.96	72.3672	177.918	0	2.63E-01	2.00E+01
34.5	440.972	72.4615	177.667	0	2.62E-01	2.00E+01
34.6	442.986	72.5556	177.416	0	2.61E-01	2.00E+01
34.7	445.002	72.6494	177.167	0	2.60E-01	2.00E+01
34.8	447.022	72.7429	176.917	0	2.60E-01	2.00E+01
34.9	449.044	72.8362	176.669	0	2.59E-01	2.00E+01
35	451.068	72.9293	176.421	0	2.58E-01	2.00E+01
35.1	453.095	73.022	176.174	0	2.58E-01	2.00E+01
35.2	455.125	73.1146	175.928	0	2.57E-01	2.00E+01
35.3	457.157	73.2068	175.682	0	2.56E-01	2.00E+01
35.4	459.192	73.2988	175.437	0	2.55E-01	2.00E+01
35.5	461.229	73.3906	175.193	0	2.55E-01	2.00E+01
35.6	463.269	73.4821	174.949	0	2.54E-01	2.00E+01
35.7	465.312	73.5734	174.706	0	2.53E-01	2.00E+01
35.8	467.357	73.6644	174.464	0	2.53E-01	2.00E+01
35.9	469.404	73.7552	174.222	0	2.52E-01	2.00E+01
36	471.454	73.8457	173.981	0	2.51E-01	2.00E+01
36.1	473.507	73.9359	173.741	0	2.51E-01	2.00E+01
36.2	475.562	74.0259	173.501	0	2.50E-01	2.00E+01
36.3	477.619	74.1157	173.262	0	2.49E-01	2.00E+01
36.4	479.679	74.2052	173.024	0	2.48E-01	2.00E+01
36.5	481.742	74.2945	172.786	0	2.48E-01	2.00E+01
36.6	483.807	74.3835	172.549	0	2.47E-01	2.00E+01
36.7	485.874	74.4723	172.313	0	2.46E-01	2.00E+01
36.8	487.944	74.5609	172.077	0	2.46E-01	2.00E+01
36.9	490.017	74.6491	171.842	0	2.45E-01	2.00E+01
37	492.091	74.7372	171.608	0	2.44E-01	2.00E+01
37.1	494.169	74.825	171.374	0	2.44E-01	2.00E+01
37.2	496.248	74.9126	171.141	0	2.43E-01	2.00E+01
37.3	498.33	74.9907	74.3083	0	1.89E-01	2.00E+01

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

00012312



37.4	500.413	74.9467	0	0	-2.18E-01	2.00E+01
37.5	502.494	74.868	0	0	-2.18E-01	2.00E+01
37.6	504.572	74.7894	0	0	-2.18E-01	2.00E+01
37.7	506.649	74.7109	0	0	-2.18E-01	2.00E+01
37.8	508.723	74.6323	0	0	-0.218237	20
37.9	510.795	74.5537	0	0	-0.2182	20
38	512.865	74.4752	0	0	-0.218163	20
38.1	514.933	74.3967	0	0	-0.218126	20
38.2	516.998	74.3182	0	0	-0.218089	20
38.3	519.061	74.2397	0	0	-0.218053	20
38.4	521.123	74.1612	0	0	-0.218016	20
38.5	523.181	74.0827	0	0	-0.217979	20
38.6	525.238	74.0042	0	0	-0.217942	20
38.7	527.293	73.9258	0	0	-0.217906	20
38.8	529.345	73.8473	0	0	-0.217869	20
38.9	531.395	73.7689	0	0	-0.217833	20
39	533.443	73.6905	0	0	-0.217796	20
39.1	535.489	73.6121	0	0	-0.217759	20
39.2	537.533	73.5337	0	0	-0.217723	20
39.3	539.575	73.4554	0	0	-0.217687	20
39.4	541.614	73.377	0	0	-0.21765	20
39.5	543.651	73.2987	0	0	-0.217614	20
39.6	545.686	73.2203	0	0	-0.217577	20
39.7	547.719	73.142	0	0	-0.217541	20
39.8	549.75	73.0637	0	0	-0.217505	20
39.9	551.778	72.9854	0	0	-0.217469	20
40	553.804	72.9071	0	0	-0.217432	20
40.1	555.828	72.8289	0	0	-0.217396	20
40.2	557.85	72.7506	0	0	-0.21736	20
40.3	559.87	72.6724	0	0	-0.217324	20
40.4	561.888	72.5941	0	0	-0.217288	20
40.5	563.903	72.5159	0	0	-0.217252	20
40.6	565.916	72.4377	21.7368	0	-0.217216	20
40.7	567.928	72.1941	-345.55	-49.0258	-1.19884	20
40.8	569.927	71.7333	-347.685	-46.9683	-1.28018	20
40.9	571.913	71.2724	-349.821	-44.9108	-1.28018	20
41	573.886	70.8116	-351.956	-42.8528	-1.28018	20
41.1	575.847	70.3507	-354.092	-40.7946	-1.28018	20
41.2	577.795	69.8898	-356.351	-38.6123	-1.28018	20
41.3	579.73	69.429	-359.004	-36.0359	-1.28018	20
41.4	581.652	68.9681	-361.66	-33.457	-1.28018	20
41.5	583.561	68.5072	-364.343	-30.8494	-1.28018	20
41.6	585.458	68.0464	-367.027	-28.2414	-1.28018	20
41.7	587.341	67.5855	-368.355	-26.9885	-1.28018	20
41.8	589.212	67.1246	-369.531	-25.8871	-1.28E+00	20
41.9	591.071	66.6638	-369.849	-25.6428	-1.28018	20
42	592.916	66.2029	-369.849	-25.7166	-1.28018	20
42.1	594.748	65.742	-369.85	-25.7901	-1.28018	20
42.2	596.568	65.2812	-369.85	-25.8635	-1.28018	20
42.3	598.375	64.8203	-369.85	-25.9363	-1.28018	20
42.4	600.169	64.3594	-369.85	-26.0091	-1.28018	20
42.5	601.951	63.8986	-369.85	-26.0811	-1.28018	20
42.6	603.719	63.4377	-369.85	-26.1529	-1.28018	20
42.7	605.475	62.9768	-369.85	-26.2242	-1.28018	20
42.8	607.218	62.516	-369.85	-26.2952	-1.28018	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

00012313



42.9	608.948	62.0551	-369.85	-26.3659	-1.28018	20
43	610.665	61.5942	-369.849	-26.4374	-1.28018	20
43.1	612.37	61.1334	-369.848	-26.5089	-1.28018	20
43.2	614.062	60.6725	-369.848	-26.5788	-1.28018	20
43.3	615.741	60.2116	-369.848	-26.6482	-1.28018	20
43.4	617.407	59.7508	-369.848	-26.717	-1.28E+00	20
43.5	619.06	59.2899	-369.848	-26.7858	-1.28018	20
43.6	620.701	58.8291	-369.848	-26.8539	-1.28018	20
43.7	622.328	58.3682	-369.848	-26.9218	-1.28018	20
43.8	623.944	57.9073	-369.848	-26.9891	-1.28018	20
43.9	625.545	57.4465	-369.848	-27.0563	-1.28018	20
44	627.135	56.9856	-369.848	-27.1229	-1.28018	20
44.1	628.711	56.5247	-369.848	-27.1892	-1.28018	20
44.2	630.275	56.0639	-369.848	-27.2552	-1.28018	20
44.3	631.826	55.603	-369.848	-27.3208	-1.28018	20
44.4	633.364	55.1421	-369.849	-27.3863	-1.28018	20
44.5	634.89	54.6813	-369.849	-27.4512	-1.28018	20
44.6	636.402	54.2204	-369.849	-27.5159	-1.28018	20
44.7	637.902	53.7595	-369.849	-27.5799	-1.28018	20
44.8	639.388	53.2987	-369.849	-27.6438	-1.28018	20
44.9	640.863	52.8378	-369.849	-27.7071	-1.28018	20
45	642.324	52.3769	-369.849	-27.7703	-1.28018	20
45.1	643.773	51.9161	-369.849	-27.8331	-1.28018	20
45.2	645.208	51.4552	-369.849	-27.8958	-1.28018	20
45.3	646.631	50.9943	-369.849	-27.9581	-1.28018	20
45.4	648.042	50.5335	-369.849	-28.02	-1.28018	20
45.5	649.438	50.0726	-369.849	-28.0815	-1.28018	20
45.6	650.823	49.6117	-369.847	-28.1445	-1.28018	20
45.7	652.195	49.1509	-369.845	-28.2076	-1.28018	20
45.8	653.553	48.69	-369.844	-28.2683	-1.28018	20
45.9	654.9	48.2291	-369.844	-28.3281	-1.28018	20
46	656.233	47.7683	-369.844	-28.3876	-1.28018	20
46.1	657.553	47.3074	-369.844	-28.4469	-1.28018	20
46.2	658.861	46.8465	-369.844	-28.5054	-1.28018	20
46.3	660.156	46.3857	-369.845	-28.5638	-1.28018	20
46.4	661.438	45.9248	-369.845	-28.6216	-1.28018	20
46.5	662.707	45.464	-369.845	-28.6794	-1.28018	20
46.6	663.964	45.0031	-369.845	-28.7367	-1.28018	20
46.7	665.208	44.5422	-369.845	-28.794	-1.28018	20
46.8	666.438	44.0814	-369.845	-28.8509	-1.28018	20
46.9	667.656	43.6205	-369.845	-28.9072	-1.28018	20
47	668.862	43.1596	-369.845	-28.9632	-1.28018	20
47.1	670.055	42.6988	-369.845	-29.019	-1.28018	20
47.2	671.234	42.2379	-369.845	-29.0743	-1.28018	20
47.3	672.4	41.777	-369.845	-29.1289	-1.28018	20
47.4	673.554	41.3162	-369.845	-29.1832	-1.28018	20
47.5	674.696	40.8553	-369.845	-29.2372	-1.28018	20
47.6	675.825	40.3944	-369.845	-29.291	-1.28018	20
47.7	676.941	39.9336	-369.846	-29.3442	-1.28018	20
47.8	678.044	39.4727	-369.846	-29.3971	-1.28018	20
47.9	679.133	39.0118	-369.846	-29.4494	-1.28018	20
48	680.21	38.551	-369.846	-29.5018	-1.28018	20
48.1	681.274	38.0901	-369.846	-29.5538	-1.28018	20
48.2	682.326	37.6292	-369.846	-29.6055	-1.28018	20
48.3	683.365	37.1684	-369.846	-29.6568	-1.28018	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012914

48.4	684.391	36.7075	-369.846	-29.7079	-1.28018	20
48.5	685.404	36.2466	-369.846	-29.7584	-1.28018	20
48.6	686.404	35.7858	-369.846	-29.8082	-1.28018	20
48.7	687.392	35.3249	-369.847	-29.8579	-1.28018	20
48.8	688.367	34.864	-369.845	-29.9087	-1.28018	20
48.9	689.329	34.4032	-369.84	-29.9632	-1.28018	20
49	690.278	33.9423	-369.835	-30.0166	-1.28018	20
49.1	691.215	33.4814	-369.836	-30.0649	-1.28018	20
49.2	692.139	33.0206	-369.836	-30.1127	-1.28018	20
49.3	693.05	32.5597	-369.843	-30.1538	-1.28018	20
49.4	693.948	32.0988	-369.85	-30.1939	-1.28018	20
49.5	694.833	31.638	-369.851	-30.2394	-1.28018	20
49.6	695.705	31.1771	-369.851	-30.2857	-1.28018	20
49.7	696.564	30.7163	-369.851	-30.3318	-1.28018	20
49.8	697.411	30.2554	-369.851	-30.3775	-1.28018	20
49.9	698.245	29.7945	-369.851	-30.4228	-1.28018	20
50	699.067	29.3337	-369.851	-30.468	-1.28018	20
50.1	699.875	28.8728	-369.851	-30.5127	-1.28018	20
50.2	700.67	28.4119	-369.851	-30.5571	-1.28018	20
50.3	701.452	27.9511	-369.851	-30.6013	-1.28018	20
50.4	702.223	27.4902	-369.851	-30.6452	-1.28018	20
50.5	702.982	27.0293	-369.851	-30.6885	-1.28018	20
50.6	703.724	26.5685	-369.851	-30.7315	-1.28018	20
50.7	704.455	26.1076	-369.851	-30.7742	-1.28018	20
50.8	705.175	25.6467	-369.851	-30.8165	-1.28018	20
50.9	705.882	25.1859	-369.852	-30.8585	-1.28018	20
51	706.573	24.725	-369.852	-30.9	-1.28018	20
51.1	707.254	24.2641	-3.70E+02	-30.9413	-1.28018	20
51.2	707.923	23.8033	-3.70E+02	-30.9821	-1.28018	20
51.3	708.575	23.3424	-3.70E+02	-31.0224	-1.28018	20
51.4	709.218	22.8815	-3.70E+02	-31.0624	-1.28018	20
51.5	709.848	22.4207	-3.70E+02	-31.102	-1.28018	20
51.6	710.462	21.9598	-3.70E+02	-31.1411	-1.28018	20
51.7	711.069	21.4989	-3.70E+02	-31.1801	-1.28018	20
51.8	711.657	21.0381	-3.70E+02	-31.2186	-1.28018	20
51.9	712.235	20.5772	-3.70E+02	-31.2569	-1.28018	20
52	712.801	20.1163	-3.70E+02	-31.2948	-1.28018	20
52.1	713.352	19.6555	-369.852	-31.3324	-1.28018	20
52.2	713.894	19.1946	-369.852	-31.3698	-1.28018	20
52.3	714.417	18.7338	-369.852	-31.4065	-1.28018	20
52.4	714.935	18.2729	-369.852	-31.4431	-1.28018	20
52.5	715.432	17.812	-369.852	-31.479	-1.28018	20
52.6	715.925	17.3512	-369.852	-31.5149	-1.28018	20
52.7	716.395	16.8903	-369.852	-31.55	-1.28018	20
52.8	716.861	16.4294	-369.852	-31.585	-1.28018	20
52.9	717.308	15.9686	-369.852	-31.6196	-1.28018	20
53	717.746	15.5077	-369.852	-31.654	-1.28018	20
53.1	718.171	15.0468	-369.852	-31.6881	-1.28018	20
53.2	718.578	14.586	-369.852	-31.7216	-1.28018	20
53.3	718.986	14.1251	-369.852	-31.7551	-1.28018	20
53.4	719.362	13.6642	-369.852	-31.7875	-1.28018	20
53.5	719.737	13.2034	-369.852	-31.8199	-1.28018	20
53.6	720.101	12.7425	-369.852	-31.852	-1.28018	20
53.7	720.44	12.2816	-369.852	-31.8836	-1.28018	20
53.8	720.779	11.8208	-369.852	-31.9152	-1.28018	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012315

53.9	721.104	11.3599	-369.852	-31.9464	-1.28018	20
54	721.402	10.899	-3.70E+02	-31.9769	-1.28018	20
54.1	721.701	10.4382	-3.70E+02	-32.0074	-1.28018	20
54.2	721.999	9.97731	-3.68E+02	-33.6807	-1.28018	20
54.3	722.251	9.51645	-3.35E+02	-67.0795	-1.28018	20
54.4	722.503	9.05558	-3.01E+02	-100.478	-1.28018	20
54.5	722.755	8.59472	-2.67E+02	-134.543	-1.28018	20
54.6	723.005	8.13385	-2.33E+02	-168.698	-1.28018	20
54.7	723.198	7.67299	-1.99E+02	-202.801	-1.28018	20
54.8	723.391	7.21213	-1.65E+02	-236.904	-1.28017	20
54.9	723.584	6.75128	-1.31E+02	-271.007	-1.28017	20
55	723.777	6.29042	-9.68E+01	-305.111	-1.28017	20
55.1	723.97	5.82956	-6.27E+01	-339.214	-1.28016	20
55.2	724.068	5.36892	-2.85E+01	-373.322	-1.28011	20
55.3	724.148	4.90833	-1.11E+00	-400.754	-1.28005	20
55.4	724.228	4.44773	-5.49E-01	-401.32	-1.28	20
55.5	724.308	3.98714	8.93E-06	-401.869	-1.27994	20
55.6	724.388	3.52654	3.64E-05	-401.869	-1.27988	20
55.7	724.468	3.06595	6.39E-05	-401.869	-1.27982	20
55.8	724.548	2.60535	1.16E-04	-401.869	-1.27976	20
55.9	724.628	2.14476	1.71E-04	-401.869	-1.2797	20
56	724.708	1.68416	3.04E-04	-401.869	-1.27964	20
56.1	724.788	1.22357	4.72E-04	-401.869	-1.27959	20
56.2	724.868	0.762974	4.23E-04	-401.869	-1.27953	20
56.3	724.947	0.302379	1.68E-04	-401.869	-1.27947	20
56.4	725	0	0.00E+00	0	0	20
56.5	725	0	0.00E+00	0	0	20
56.6	725	0	0.00E+00	0	0	20
56.7	725	0	0.00E+00	0	0	20
56.8	725	0	0.00E+00	0	0	20
56.9	725	0	0.00E+00	0	0	20
57	725	0	0.00E+00	0	0	20
57.1	725	0	0.00E+00	0	0	20
57.2	725	0	0.00E+00	0	0	20
57.3	725	0	0.00E+00	0	0	20
57.4	725	0.00E+00	0.00E+00	0	0	20
57.5	725	0	0.00E+00	0	0	20
57.6	725	0	0.00E+00	0	0	20
57.7	725	0	0.00E+00	0	0	20
57.8	725	0	0	0	0	20
57.9	725	0	0	0	0	20
58	725	0	0	0	0	20
58.1	725	0	0	0	0	20
58.2	725	0	0	0	0	20
58.3	725	0	0	0	0	20
58.4	725	0	0	0	0	20
58.5	725	0	0	0	0	20
58.6	725	0	0	0	0	20
58.7	725	0	0	0	0	20
58.8	725	0	0	0	0	20
58.9	725	0	0	0	0	20
59	725	0	0	0	0	20
59.1	725	0	0	0	0	20
59.2	725	0	0	0	0	20
59.3	725	0	0	0	0	20

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

ALSTOM

00012916

59.4	725	0	0	0	0	20
59.5	725	0	0	0	0	20
59.6	725	0	0	0	0	20
59.7	725	0	0	0	0	20
59.8	725	0	0	0	0	20
59.9	725	0	0	0	0	20
60	725	0	0	0	0	20
60.1	725	0	0	0	0	20
60.2	725	0	0	0	0	20
60.3	725	0	0	0	0	20
60.4	725	0	0	0	0	20
60.5	725	0	0	0	0	20
60.6	725	0	0	0	0	20
60.7	725	0	0	0	0	20
60.8	725	0	0	0	0	20
60.9	725	0	0	0	0	20
61	725	0	0.00E+00	0	0	20
61.1	725	0	0.00E+00	0	0	20
61.2	725	0	0.00E+00	0	0	20
61.3	725	0	0.00E+00	0	0	20
61.4	725	0	0.00E+00	0	0	20
61.5	725	0	0.00E+00	0	0	20
61.6	725	0	0.00E+00	0	0	20
61.7	725	0	0.00E+00	0	0	20
61.8	725	0	0.00E+00	0	0	20
61.9	725	0	0.00E+00	0	0	20
62	725	0	0	0	0	20
62.1	725	0	0	0	0	20
62.2	725	0	0	0	0	20
62.3	725	0	0	0	0	20
62.4	725	0	0	0	0	20
62.5	725	0	0	0	0	20
62.6	725	0	0	0	0	20
62.7	725	0	0	0	0	20
62.8	725	0	0	0	0	20
62.9	725	0	0	0	0	20
63	725	0	0	0	0	20
63.1	725	0	0	0	0	20
63.2	725	0	0	0	0	20
63.3	725	0	0	0	0	20
63.4	725	0	0.00E+00	0	0	20
63.5	725	0	0.00E+00	0	0	20
63.6	725	0	0.00E+00	0	0	20
63.7	725	0	0.00E+00	0	0	20
63.8	725	0	0.00E+00	0	0	20
63.9	725	0	0.00E+00	0	0	20
64	725	0	0.00E+00	0	0	20
64.1	725	0	0.00E+00	0	0	20
64.2	725	0	0	0	0	20
64.3	725	0	0	0	0	20
64.4	725	0	0	0	0	20
64.5	725	0	0	0	0	20
64.6	725	0	0	0	0	20
64.7	725	0	0	0	0	20
64.8	725	0	0	0	0	20

3610

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls

00012917

ALSTOM

64.9	725	0	0	0	0	20
65	725	0	0	0	0	20
65.1	725	0	0	0	0	20
65.2	725	0	0	0	0	20
65.3	725	0	0	0	0	20
65.4	725	0	0	0	0	20
65.5	725	0	0	0	0	20
65.6	725	0	0	0	0	20
65.7	725	0	0	0	0	20
65.8	725	0	0	0	0	20
65.9	725	0	0	0	0	20
66	725	0	0	0	0	20
66.1	725	0	0	0	0	20
66.2	725	0	0	0	0	20
66.3	725	0	0	0	0	20
66.4	725	0	0	0	0	20
66.5	725	0	0	0	0	20
66.6	725	0	0	0	0	20
66.7	725	0	0	0	0	20
66.8	725	0	0	0	0	20
66.9	725	0	0	0	0	20
67	725	0	0	0	0	20
67.1	725	0	0	0	0	20
67.2	725	0	0	0	0	20
67.3	725	0	0	0	0	20
67.4	725	0	0	0	0	20
67.5	725	0	0	0	0	20
67.6	725	0	0	0	0	20
67.7	725	0	0	0	0	20
67.8	725	0	0	0	0	20
67.9	725	0	0	0	0	20
68	725	0	0	0	0	20
68.1	725	0	0	0	0	20
68.2	725	0	0	0	0	20
68.3	725	0	0	0	0	20
68.4	725	0	0	0	0	20
68.5	725	0	0	0	0	20
68.6	725	0	0	0	0	20
68.7	725	0	0	0	0	20
68.8	725	0	0	0	0	20
68.9	725	0	0	0	0	20
69	725	0	0	0	0	20
69.1	725	0	0	0	0	20
69.2	725	0	0	0	0	20
69.3	725	0	0	0	0	20
69.4	725	0	0	0	0	20
69.5	725	0	0	0	0	20
69.6	725	0	0	0	0	20
69.7	725	0	0	0	0	20
69.8	725	0	0	0	0	20
69.9	725	0	0	0	0	20
70	725	0	0	0	0	20
70.1	725	0	0	0	0	20
70.2	725	0	0	0	0	20
70.3	725	0	0	0	0	20

3611

ANEXO 1E
SIMULACIONES, CÁLCULOS Y GRÁFICAS

Cycles EBRCL130 R00.xls
00012918

ALSTOM

70.4	725	0	0	0	0	20
70.5	725	0	0	0	0	20
70.6	725	0	0	0	0	20
70.7	725	0	0	0	0	20
70.8	725	0	0	0	0	20
70.9	725	0	0	0	0	20
71	725	0	0	0	0	20
71.1	725	0	0	0	0	20
71.2	725	0	0	0	0	20
71.3	725	0	0	0	0	20
71.4	725	0	0	0	0	20
71.5	725	0	0	0	0	20
71.6	725	0	0	0	0	20
71.7	725	0	0	0	0	20
71.8	725	0	0	0	0	20
71.9	725	0	0	0	0	20
72	725	0	0	0	0	20
72.1	725	0	0	0	0	20
72.2	725	0	0	0	0	20
72.3	725	0	0	0	0	20
72.4	725	0	0	0	0	20
72.5	725	0	0	0	0	20
72.6	725	0	0	0	0	20
72.7	725	0	0	0	0	20
72.8	725	0	0	0	0	20
72.9	725	0	0	0	0	20
73	725	0	0	0	0	20
73.1	725	0	0	0	0	20
73.2	725	0	0	0	0	20
73.3	725	0	0	0	0	20
73.4	725	0	0	0	0	20




169500

Cycles for "Servicio Continuo"

distance(m)	speed(km/h)	gradient(0/00)
0	0	0
0.752845	4.08078	0
2.28761	8.15956	0
5.10383	12.2352	0
9.06561	16.308	0
14.1616	20.3776	0
20.3875	24.4439	0
27.7407	28.5066	0
36.2219	32.5555	0
45.8196	36.5201	0
56.4698	40.0802	0
68.0514	43.2681	0
80.4835	46.2024	0
93.7026	48.9472	0
107.661	51.5292	0
122.317	53.9742	0
137.635	56.2942	0
153.582	58.5099	0
170.131	60.6288	0
187.258	62.6724	0
204.943	64.6497	0
223.169	66.565	0
241.918	68.425	0
261.178	70.2314	0
280.931	71.9855	0
301.165	73.6885	0
321.864	75.3419	0
343.017	76.9472	0
364.609	78.5056	0
386.627	79.9913	0
408.829	79.8503	0
430.988	79.6982	0
453.105	79.5465	0
474.87	76.4761	0
495.563	72.5161	0
515.156	68.5561	0
533.65	64.5962	0
551.043	60.6362	0
567.336	56.6763	0
582.53	52.7163	0
596.623	48.7563	0
609.616	44.7964	0
621.509	40.8364	0
632.303	36.8765	0
641.997	32.9165	0
650.589	28.9565	0
658.084	24.9966	0
664.474	21.0366	0
669.767	17.0767	0

Dist(m)	Application
0	1:MEXICO DRIVE A1
6800	2:MEXICO DRIVE B1
10150	1:MEXICO DRIVE A1
16950	

[Handwritten signature]

[Handwritten mark]

ALSTOM

00012920

673.964	13.1167	0
677.053	9.15676	0
679.026	5.19708	0
679.768	1.23979	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680	0	0
680.517	2.8023	0
681.651	6.8821	0
684.095	10.9586	0
687.707	15.0323	0
692.446	19.103	0
698.316	23.1704	0
705.316	27.2342	0
713.444	31.2921	0
722.694	35.3027	0
733.027	39.0161	0
744.329	42.2981	0
756.502	45.3066	0
769.479	48.1057	0
783.211	50.7358	0
797.653	53.2222	0
812.767	55.5793	0
828.52	57.8264	0
844.883	59.9746	0
861.831	62.0394	0
879.344	64.0372	0
897.402	65.971	0
915.989	67.8481	0
935.09	69.6711	0
954.69	71.4415	0
974.775	73.1603	0
995.33	74.8292	0
1016.34	76.4494	0
1037.8	78.0223	0
1059.68	79.5494	0
1081.88	79.8979	0
1104.05	79.7458	0
1126.18	79.594	0
1148.16	77.7167	0
1169.2	73.7567	0

[Handwritten signature]

[Handwritten mark]

3614



00012921

1189.14	69.7968	0
1207.97	65.8368	0
1225.71	61.8769	0
1242.35	57.9169	0
1257.89	53.9569	0
1272.33	49.997	0
1285.66	46.037	0
1297.9	42.077	0
1309.04	38.1171	0
1319.08	34.1571	0
1328.02	30.1972	0
1335.85	26.2372	0
1342.59	22.2772	0
1348.23	18.3173	0
1352.76	14.3573	0
1356.2	10.3974	0
1358.5	6.43755	0
1359.54	2.47958	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360	0	0
1360.28	1.52382	0
1361.08	5.60448	0
1363.2	9.68179	0
1366.46	13.7564	0
1370.84	17.828	0
1376.36	21.8965	0
1383	25.9614	0
1390.78	30.0227	0
1399.68	34.0532	0
1409.68	37.9055	0
1420.69	41.3022	0
1432.6	44.391	0
1445.33	47.2475	0
1458.83	49.929	0
1473.05	52.4576	0
1487.96	54.8541	0
1503.52	57.1333	0
1519.69	59.312	0
1536.46	61.3998	0
1553.8	63.4184	0



1

ALSTOM

00012322

1571.69	65.3715	0
1590.11	67.2659	0
1609.05	69.1057	0
1628.5	70.8924	0
1648.43	72.6273	0
1668.84	74.3116	0
1689.71	75.9469	0
1711.03	77.5345	0
1732.78	79.0759	0
1754.92	79.9457	0
1777.11	79.7935	0
1799.25	79.6415	0
1821.34	78.9573	0
1842.73	74.9974	0
1863.01	71.0374	0
1882.19	67.0774	0
1900.27	63.1175	0
1917.26	59.1575	0
1933.14	55.1976	0
1947.92	51.2376	0
1961.6	47.2776	0
1974.19	43.3177	0
1985.67	39.3577	0
1996.05	35.3977	0
2005.33	31.4378	0
2013.52	27.4778	0
2020.6	23.5179	0
2026.58	19.5579	0
2031.46	15.598	0
2035.24	11.638	0
2037.92	7.67811	0
2039.3	3.71937	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040	0	0
2040.05	0.245343	0
2040.8	4.32612	0
2042.43	8.40466	0
2045.32	12.4801	0
2049.34	16.5527	0
2054.51	20.6222	0

[Handwritten signature]

[Handwritten mark]



00012923

2060.8	24.6883	0
2068.22	28.7507	0
2076.77	32.7973	0
2086.43	36.7477	0
2097.14	40.2798	0
2108.78	43.4512	0
2121.26	46.3724	0
2134.52	49.1068	0
2148.52	51.6799	0
2163.22	54.117	0
2178.58	56.4303	0
2194.56	58.6399	0
2211.14	60.7536	0
2228.31	62.7931	0
2246.02	64.7665	0
2264.28	66.6783	0
2283.06	68.5351	0
2302.35	70.3383	0
2322.13	72.0893	0
2342.4	73.7893	0
2363.12	75.4398	0
2384.3	77.0422	0
2405.92	78.5979	0
2427.96	79.9934	0
2450.16	79.8411	0
2472.32	79.6891	0
2494.43	79.5374	0
2516.14	76.238	0
2536.77	72.278	0
2556.3	68.3181	0
2574.73	64.3581	0
2592.05	60.3981	0
2608.28	56.4382	0
2623.41	52.4782	0
2637.44	48.5183	0
2650.36	44.5583	0
2662.19	40.5983	0
2672.92	36.6384	0
2682.54	32.6784	0
2691.07	28.7185	0
2698.5	24.7585	0
2704.82	20.7985	0
2710.05	16.8386	0
2714.18	12.8786	0
2717.19	8.91869	0
2719.07	4.95916	0
2719.81	1.00187	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0

ALSTOM

00012924

2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720	0	0
2720.56	3.04765	0
2721.76	7.12727	0
2724.29	11.2036	0
2727.95	15.2772	0
2732.77	19.3476	0
2738.7	23.4148	0
2745.77	27.4784	0
2753.97	31.5352	0
2763.29	35.5403	0
2773.68	39.2235	0
2785.04	42.4864	0
2797.26	45.4799	0
2810.28	48.2685	0
2824.06	50.8891	0
2838.54	53.3675	0
2853.7	55.7172	0
2869.49	57.9584	0
2885.89	60.1007	0
2902.87	62.1614	0
2920.41	64.1552	0
2938.5	66.0854	0
2957.12	67.9592	0
2976.25	69.779	0
2995.88	71.5463	0
3016	73.2621	0
3036.58	74.9279	0
3057.62	76.5452	0
3079.1	78.1154	0
3101.01	79.6398	0
3123.21	79.8888	0
3145.38	79.7367	0
3167.51	79.5849	0
3189.46	77.4786	0
3210.43	73.5187	0
3230.3	69.5587	0
3249.07	65.5987	0
3266.74	61.6388	0
3283.32	57.6788	0
3298.79	53.7188	0
3313.16	49.7589	0
3326.43	45.7989	0
3338.6	41.839	0
3349.67	37.879	0
3359.65	33.919	0
3368.52	29.9591	0
3376.29	25.9991	0

[Handwritten signature]

[Handwritten mark]



00012925

3382.96	22.0392	0
3388.53	18.0792	0
3393.01	14.1192	0
3396.36	10.1593	0
3398.61	6.19948	0
3399.58	2.24166	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400	0	0
3400.33	1.76917	0
3401.19	5.84966	0
3403.37	9.92683	0
3406.69	14.0013	0
3411.14	18.0727	0
3416.72	22.141	0
3423.44	26.2057	0
3431.28	30.2667	0
3440.25	34.2935	0
3450.32	38.1222	0
3461.38	41.4954	0
3473.34	44.5686	0
3486.12	47.4136	0
3499.67	50.0849	0
3513.93	52.6053	0
3528.88	54.9941	0
3544.47	57.2671	0
3560.68	59.4399	0
3577.49	61.5231	0
3594.86	63.5376	0
3612.78	65.487	0
3631.23	67.378	0
3650.21	69.2146	0
3669.68	70.9982	0
3689.64	72.7299	0
3710.08	74.4113	0
3730.98	76.0437	0
3752.32	77.6285	0
3774.1	79.1671	0
3796.26	79.9365	0
3818.44	79.7843	0
3840.58	79.6324	0

[Handwritten signature]

[Handwritten mark]

ALSTOM

00012926

3862.66	78.7192	0
3883.98	74.7593	0
3904.19	70.7993	0
3923.31	66.8394	0
3941.33	62.8794	0
3958.24	58.9194	0
3974.06	54.9595	0
3988.77	50.9995	0
4002.39	47.0396	0
4014.91	43.0796	0
4026.32	39.1196	0
4036.64	35.1597	0
4045.86	31.1997	0
4053.97	27.2398	0
4060.99	23.2798	0
4066.91	19.3198	0
4071.72	15.3599	0
4075.43	11.3999	0
4078.05	7.44004	0
4079.35	3.48145	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0	0
4080	0.00E+00	0
4080	0	0
4080	0	0
4080.09	0.490686	0
4080.84	4.57147	0
4082.57	8.64976	0
4085.53	12.7251	0
4089.62	16.7975	0
4094.85	20.8668	0
4101.21	24.9326	0
4108.7	28.9948	0
4117.32	33.0388	0
4127.05	36.9741	0
4137.81	40.4781	0
4149.5	43.6335	0
4162.03	46.5417	0
4175.34	49.2658	0
4189.39	51.8301	0
4204.12	54.2595	0
4219.52	56.5659	0
4235.54	58.7696	0

[Handwritten signature]

[Handwritten mark]

ALSTOM

00012927

4252.16	60.8781	0
4269.36	62.9136	0
4287.11	64.883	0
4305.4	66.7915	0
4324.21	68.645	0
4343.53	70.445	0
4363.34	72.1929	0
4383.63	73.8899	0
4404.38	75.5375	0
4425.59	77.137	0
4447.23	78.6899	0
4469.3	79.9842	0
4491.5	79.832	0
4513.65	79.68	0
4535.76	79.5283	0
4557.42	75.9999	0
4577.98	72.04	0
4597.44	68.08	0
4615.8	64.12	0
4633.06	60.1601	0
4649.22	56.2001	0
4664.28	52.2401	0
4678.24	48.2802	0
4691.11	44.3202	0
4702.87	40.3603	0
4713.53	36.4003	0
4723.09	32.4403	0
4731.55	28.4804	0
4738.91	24.5204	0
4745.17	20.5605	0
4750.33	16.6005	0
4754.38	12.6405	0
4757.33	8.68062	0
4759.12	4.72124	0
4759.86	0.763954	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760	0	0
4760.61	3.29299	0
4761.87	7.37245	0
4764.48	11.4486	0

Handwritten signature in blue ink.

Handwritten mark in red ink, resembling a stylized '0' or a signature.

ALSTOM

00012928

4768.22	15.522	0
4773.09	19.5923	0
4779.1	23.6592	0
4786.23	27.7226	0
4794.5	31.7778	0
4803.88	35.7762	0
4814.34	39.4296	0
4825.75	42.6734	0
4838.02	45.6526	0
4851.09	48.4307	0
4864.91	51.0419	0
4879.44	53.5123	0
4894.63	55.8549	0
4910.46	58.0899	0
4926.89	60.2265	0
4943.91	62.2831	0
4961.49	64.273	0
4979.61	66.1996	0
4998.26	68.0701	0
5017.42	69.8868	0
5037.08	71.6509	0
5057.22	73.3636	0
5077.83	75.0265	0
5098.9	76.641	0
5120.41	78.2084	0
5142.34	79.73	0
5164.55	79.8796	0
5186.71	79.7276	0
5208.84	79.5758	0
5230.75	77.2405	0
5251.65	73.2806	0
5271.46	69.3206	0
5290.17	65.3607	0
5307.77	61.4007	0
5324.28	57.4407	0
5339.68	53.4808	0
5353.99	49.5208	0
5367.19	45.5608	0
5379.3	41.6009	0
5390.3	37.6409	0
5400.21	33.681	0
5409.02	29.721	0
5416.72	25.761	0
5423.33	21.8011	0
5428.83	17.8411	0
5433.23	13.8812	0
5436.53	9.92122	0
5438.72	5.96142	0
5439.62	2.00374	0
5440	0	0
5440	0	0
5440	0	0
5440	0	0
5440	0	0
5440	0	0

[Handwritten signature]

[Handwritten mark]

ALSTOM

00012929

5440	0	0
5440	0	0
5440	0	0
5440	0	0
5440	0	0
5440	0	0
5440	0	0
5440	0	0
5440	0	0
5440	0	0
5440	0	0
5440.37	2.01451	0
5441.3	6.09483	0
5443.54	10.1719	0
5446.92	14.2461	0
5451.44	18.3174	0
5457.09	22.3854	0
5463.88	26.45	0
5471.79	30.5106	0
5480.82	34.5336	0
5490.95	38.3375	0
5502.08	41.6877	0
5514.09	44.7454	0
5526.91	47.5789	0
5540.5	50.2402	0
5554.81	52.7526	0
5569.8	55.1337	0
5585.43	57.4005	0
5601.68	59.5674	0
5618.52	61.6461	0
5635.92	63.6566	0
5653.87	65.6022	0
5672.36	67.49	0
5691.36	69.3233	0
5710.87	71.1038	0
5730.86	72.8324	0
5751.33	74.5108	0
5772.25	76.1403	0
5793.62	77.7223	0
5815.43	79.2581	0
5837.59	79.9273	0
5859.77	79.7752	0
5881.91	79.6233	0
5903.97	78.4812	0
5925.22	74.5212	0
5945.37	70.5613	0
5964.42	66.6013	0
5982.37	62.6413	0
5999.22	58.6814	0
6014.97	54.7214	0
6029.62	50.7614	0
6043.17	46.8015	0
6055.62	42.8415	0
6066.98	38.8815	0
6077.23	34.9216	0

[Handwritten signature]

[Handwritten mark]

5613



00012930

6086.38	30.9616	0
6094.43	27.0017	0
6101.37	23.0417	0
6107.23	19.0818	0
6111.98	15.1218	0
6115.62	11.1618	0
6118.16	7.20197	0
6119.39	3.24353	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120	0	0
6120.14	0.736028	0
6120.89	4.81681	0
6122.71	8.89486	0
6125.74	12.97	0
6129.9	17.0422	0
6135.2	21.1113	0
6141.63	25.177	0
6149.19	29.239	0
6157.87	33.2801	0
6167.67	37.1979	0
6178.49	40.6753	0
6190.23	43.8149	0
6202.81	46.7103	0
6216.17	49.4243	0
6230.25	51.9799	0
6245.03	54.4014	0
6260.47	56.7013	0
6276.52	58.899	0
6293.18	61.0024	0
6310.41	63.0338	0
6328.19	64.9994	0
6346.51	66.9045	0
6365.35	68.7547	0
6384.7	70.5516	0
6404.55	72.2963	0
6424.86	73.9903	0
6445.65	75.635	0
6466.88	77.2317	0
6488.55	78.7818	0
6510.63	79.9751	0




00012931



ALSTOM

00012932

6930.19	51.781	20
6944.82	53.5843	20
6959.95	55.2936	20
6975.54	56.9224	20
6991.57	58.4794	20
7008.02	59.9679	20
7024.88	61.3984	20
7042.12	62.7826	20
7059.75	64.1218	20
7077.74	65.4178	20
7096.09	66.6753	20
7114.78	67.8966	20
7133.81	69.0828	20
7153.16	70.2347	20
7172.82	71.3532	20
7192.8	72.4393	20
7213.06	73.4937	20
7233.62	74.5174	20
7254.4	74.6061	20
7275.01	73.8198	20
7295.41	73.0349	20
7315.55	71.2743	20
7334.71	66.67	20
7352.59	62.0656	20
7369.19	57.4613	20
7384.51	52.857	20
7398.56	48.2527	20
7411.32	43.674	20
7422.82	39.1488	20
7433.07	34.6365	20
7442.07	30.1242	20
7449.81	25.612	20
7456.29	21.0997	20
7461.52	16.5874	20
7465.5	12.0752	20
7468.21	7.56297	20
7469.46	3.05236	20
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470	0	0
7470.23	1.1402	0

[Handwritten signature]

[Handwritten mark]

6626

ALSTOM

00012933

7470.93	4.66867	0
7472.67	8.19451	0
7475.42	11.7179	0
7479.16	15.239	0
7483.88	18.7573	0
7489.58	22.2729	0
7496.25	25.7854	20
7503.9	29.2947	20
7512.52	32.7865	20
7522.11	36.2064	20
7532.6	39.2856	20
7543.9	42.0079	20
7555.92	44.4619	20
7568.58	46.69	20
7581.84	48.7791	20
7595.67	50.7427	20
7610.02	52.6003	20
7624.88	54.3608	20
7640.22	56.0318	20
7656	57.6282	20
7672.22	59.1541	20
7688.86	60.6141	20
7705.89	62.0237	20
7723.31	63.3876	20
7741.11	64.7072	20
7759.26	65.9853	20
7777.76	67.2265	20
7796.6	68.4319	20
7815.78	69.6026	20
7835.27	70.7395	20
7855.07	71.8434	20
7875.18	72.9151	20
7895.58	73.9557	20
7916.26	74.9657	20
7936.99	74.2409	20
7957.51	73.4553	20
7977.8	72.671	20
7997.45	68.451	20
8015.83	63.8467	20
8032.92	59.2423	20
8048.74	54.638	20
8063.28	50.0337	20
8076.53	45.4382	20
8088.52	40.8944	20
8099.26	36.3819	20
8108.74	31.8697	20
8116.96	27.3574	20
8123.93	22.8451	20
8129.65	18.3329	20
8134.12	13.8206	20
8137.31	9.30833	20
8139.16	4.79675	20
8139.95	0.287153	20
8140	0	0
8140	0	0

[Handwritten signature]

[Handwritten mark]

ALSTOM

00012934

8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140	0	0
8140.66	3.3038	0
8141.86	6.83098	0
8144.23	1.04E+01	0
8147.6	13.8773	0
8151.94	17.3967	0
8157.26	20.9133	0
8163.55	24.4271	20
8170.83	27.9377	20
8179.07	31.4417	20
8188.29	34.9016	20
8198.44	38.143	20
8209.44	40.9866	20
8221.19	43.5436	20
8233.61	45.8462	20
8246.64	47.9865	20
8260.26	49.997	20
8274.41	51.8935	20
8289.08	53.691	20
8304.23	55.3948	20
8319.84	57.0192	20
8335.9	58.572	20
8352.38	60.0563	20
8369.26	61.484	20
8386.53	62.8653	20
8404.18	64.2019	20
8422.19	65.4954	20
8440.56	66.7507	20
8459.27	67.9698	20
8478.32	69.1538	20
8497.69	70.3037	20
8517.38	71.4202	20
8537.37	72.5043	20
8557.65	73.5568	20
8578.23	74.5787	20
8599	74.5452	20
8619.6	73.759	20
8639.98	72.9742	20
8660	70.232	20
8678.87	65.6277	20
8696.46	61.0234	20




5628

ALSTOM

00012935

8712.77	56.4191	20
8727.8	51.8147	20
8741.56	47.2111	20
8754.04	42.6455	20
8765.25	38.1273	20
8775.22	33.6151	20
8783.93	29.1028	20
8791.38	24.5905	20
8797.59	20.0783	20
8802.53	15.566	20
8806.23	11.0537	20
8808.64	6.5416	20
8809.64	2.03154	20
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810	0	0
8810.38	1.93892	0
8811.2	5.46709	0
8813.2	8.99232	0
8816.18	12.5152	0
8820.14	16.0356	0
8825.08	19.5534	0
8831	23.0683	20
8837.9	26.5801	20
8845.77	30.0887	20
8854.61	33.5697	20
8864.41	36.9398	20
8875.09	39.9275	20
8886.56	42.5864	20
8898.73	44.9816	20
8911.53	47.1744	20
8924.92	49.2342	20
8938.87	51.172	20
8953.34	53.007	20
8968.31	54.7463	20
8983.75	56.3995	20
8999.64	57.9796	20
9015.95	59.4901	20
9032.68	60.9373	20
9049.8	62.3364	20
9067.31	63.6901	20

[Handwritten signature]

[Handwritten mark]

3629

ALSTOM

00012936

9085.18	64.9999	20
9103.42	66.2694	20
9122	67.5024	20
9140.91	68.6999	20
9160.16	69.8629	20
9179.72	70.9922	20
9199.6	72.0888	20
9219.77	73.1534	20
9240.24	74.187	20
9260.97	74.8496	20
9281.66	74.0629	20
9302.12	73.2776	20
9322.36	72.013	20
9341.72	67.4087	20
9359.81	62.8044	20
9376.61	58.2001	20
9392.14	53.5958	20
9406.39	48.9914	20
9419.36	44.4048	20
9431.06	39.8728	20
9441.51	35.3605	20
9450.71	30.8482	20
9458.65	26.336	20
9465.34	21.8237	20
9470.77	17.3114	20
9474.95	12.7992	20
9477.87	8.28694	20
9479.34	3.77593	20
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480	0	0
9480.11	0.574044	0
9480.81	4.10252	0
9482.31	7.62896	0
9484.91	11.1528	0
9488.5	14.6742	0
9493.05	18.193	0
9498.6	21.709	0
9505.11	25.222	20
9512.61	28.7319	20
9521.07	32.2297	20

[Handwritten signature]

[Handwritten mark]



9530.51	35.6724	20
9540.86	38.819	20
9552.04	41.5894	20
9563.94	44.0857	20
9576.51	46.3424	20
9589.68	48.4526	20
9603.41	50.4353	20
9617.69	52.3088	20
9632.46	54.0846	20
9647.72	55.7689	20
9663.44	57.3768	20
9679.59	58.9138	20
9696.16	60.3836	20
9713.14	61.8007	20
9730.49	63.1718	20
9748.23	64.4984	20
9766.32	65.7827	20
9784.77	67.0298	20
9803.56	68.2409	20
9822.68	69.4171	20
9842.12	70.5593	20
9861.87	71.6684	20
9881.93	72.7453	20
9902.29	73.7908	20
9922.92	74.8059	20
9943.68	74.3671	20
9964.23	73.5812	20
9984.56	72.7968	20
10004.3	68.899	20
10022.8	64.2947	20
10040	59.6904	20
10056	55.0861	20
10070.6	50.4818	20
10084	45.881	20
10096.1	41.3259	20
10107	36.8236	20
10116.6	32.3685	20
10125	27.9546	20
10132.1	23.5765	20
10138.1	19.2286	20
10142.8	14.9053	20
10146.3	10.601	20
10148.7	6.31045	20
10149.6	2.02973	20
10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150	0	0

00012337

5/5

3631



00012938

10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150	0	0
10150.4	1.97834	0
10151.2	5.74182	0
10153.4	9.50938	0
10156.5	13.2865	0
10160.7	17.0779	0
10166	20.8882	0
10172.3	24.7221	0
10179.7	28.584	0
10188.2	32.4693	0
10197.8	36.32	0
10208.4	39.8342	0
10219.9	43.0186	0
10232.2	45.9714	0
10245.4	48.7302	0
10259.3	51.3244	0
10273.9	53.7801	0
10289.2	56.1095	0
10305	58.3333	0
10321.5	60.4595	0
10338.6	62.5086	0
10356.3	64.4912	0
10374.5	66.4112	0
10393.2	68.2756	0
10412.4	70.0863	0
10432.1	71.8446	0
10452.3	73.5517	0
10472.9	75.2092	0
10494.1	76.8183	0
10515.6	78.3805	0
10537.6	79.8972	0
10559.8	79.8641	0
10582	79.712	0
10604.1	79.5603	0
10625.8	76.2986	0
10646.5	72.3386	0
10666	68.3786	0
10684.5	64.4187	0
10701.8	60.4587	0
10718	56.4988	0
10733.2	52.5388	0
10747.2	48.5788	0
10760.2	44.6189	0
10772	40.6589	0
10782.8	36.6989	0
10792.4	32.739	0
10800.9	28.779	0
10808.4	24.8191	0
10814.7	20.8591	0
10820	16.8992	0

SL

3632

3632

ALSTOM

00012339

10824.1	12.9392	0
10827.2	8.97926	0
10829.1	5.01969	0
10829.8	1.0624	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830	0	0
10830.6	2.98522	0
10831.7	7.0649	0
10834.2	11.1413	0
10837.9	15.2149	0
10842.7	19.2854	0
10848.6	23.3526	0
10855.7	27.4163	0
10863.8	31.4733	0
10873.1	35.4803	0
10883.5	39.1707	0
10894.9	42.4385	0
10907.1	45.4359	0
10920.1	48.2272	0
10933.8	50.8502	0
10948.3	53.3306	0
10963.5	55.6822	0
10979.2	57.9248	0
10995.6	60.0686	0
11012.6	62.1304	0
11030.1	64.1252	0
11048.2	66.0563	0
11066.8	67.931	0
11086	69.7516	0
11105.6	71.5196	0
11125.7	73.2362	0
11146.3	74.9028	0
11167.3	76.5209	0
11188.8	78.0918	0
11210.7	79.6168	0
11232.9	79.8911	0
11255	79.739	0
11277.2	79.5872	0
11299.1	77.5392	0
11320.1	73.5792	0

Handwritten signature

Red handwritten mark

3633

00012340





11722.5	65.4576	0
11740.9	67.3495	0
11759.9	69.1869	0
11779.4	70.9713	0
11799.3	72.7038	0
11819.8	74.386	0
11840.7	76.0191	0
11862	77.6046	0
11883.8	79.1439	0
11905.9	79.9388	0
11928.1	79.7866	0
11950.2	79.6347	0
11972.3	78.7798	0
11993.7	74.8199	0
12013.9	70.8599	0
12033	66.8999	0
12051.1	62.94	0
12068	58.98	0
12083.8	55.02	0
12098.6	51.0601	0
12112.2	47.1001	0
12124.7	43.1402	0
12136.2	39.1802	0
12146.5	35.2202	0
12155.7	31.2603	0
12163.9	27.3003	0
12170.9	23.3404	0
12176.8	19.3804	0
12181.7	15.4204	0
12185.4	11.4605	0
12188	7.50061	0
12189.3	3.54198	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190	0	0
12190.1	0.428265	0
12190.8	4.50905	0
12192.5	8.5874	0
12195.5	12.6628	0
12199.6	16.7352	0
12204.8	20.8045	0

00012941

[Handwritten signature]

[Handwritten mark]

5635

ALSTOM

00012942

12211.1	24.8705	0
12218.6	28.9327	0
12227.2	32.9774	0
12236.9	36.9167	0
12247.6	40.4277	0
12259.3	43.5872	0
12271.8	46.4987	0
12285.1	49.2255	0
12299.2	51.792	0
12313.9	54.2233	0
12329.3	56.5315	0
12345.3	58.7367	0
12361.9	60.8465	0
12379.1	62.883	0
12396.8	64.8534	0
12415.1	66.7627	0
12433.9	68.6171	0
12453.2	70.4179	0
12473	72.1666	0
12493.3	73.8643	0
12514.1	75.5126	0
12535.3	77.1129	0
12556.9	78.6665	0
12579	79.9866	0
12601.2	79.8343	0
12623.3	79.6823	0
12645.4	79.5306	0
12667.1	76.0605	0
12687.7	72.1005	0
12707.1	68.1406	0
12725.5	64.1806	0
12742.8	60.2206	0
12759	56.2607	0
12774.1	52.3007	0
12788	48.3407	0
12800.9	44.3808	0
12812.7	40.4208	0
12823.4	36.4609	0
12833	32.5009	0
12841.4	28.5409	0
12848.8	24.581	0
12855.1	20.621	0
12860.3	16.6611	0
12864.3	12.7011	0
12867.3	8.74119	0
12869.1	4.78177	0
12869.8	0.824486	0
12870	0	0
12870	0	0
12870	0	0
12870	0	0
12870	0	0
12870	0	0
12870	0	0
12870	0	0

[Handwritten signature]

[Handwritten mark]

ALSTOM

00012943

12870	0	0
12870	0	0
12870	0	0
12870	0	0
12870	0	0
12870	0	0
12870	0	0
12870	0	0
12870	0	0
12870.6	3.23057	0
12871.8	7.31007	0
12874.4	11.3863	0
12878.1	15.4597	0
12883	19.53	0
12889	23.597	0
12896.1	27.6605	0
12904.4	31.7161	0
12913.7	35.7162	0
12924.2	39.3775	0
12935.6	42.6258	0
12947.8	45.6087	0
12960.9	48.3895	0
12974.7	51.0031	0
12989.2	53.4755	0
13004.4	55.8199	0
13020.2	58.0565	0
13036.6	60.1945	0
13053.6	62.2522	0
13071.2	64.2431	0
13089.3	66.1705	0
13108	68.0419	0
13127.1	69.8594	0
13146.8	71.6242	0
13166.9	73.3378	0
13187.5	75.0014	0
13208.6	76.6166	0
13230.1	78.1847	0
13252	79.7071	0
13274.2	79.882	0
13296.4	79.7299	0
13318.5	79.5781	0
13340.4	77.3011	0
13361.3	73.3412	0
13381.2	69.3812	0
13399.9	65.4212	0
13417.5	61.4613	0
13434	57.5013	0
13449.5	53.5413	0
13463.8	49.5814	0
13477	45.6214	0
13489.1	41.6615	0
13500.1	37.7015	0
13510.1	33.7415	0
13518.9	29.7816	0
13526.6	25.8216	0

Handwritten signature in blue ink.

Handwritten signature in red ink.

3637

ALSTOM

13533.2	21.8617	0
13538.8	17.9017	0
13543.2	13.9417	0
13546.5	9.98179	0
13548.7	6.02199	0
13549.6	2.06428	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550	0	0
13550.4	1.95209	0
13551.3	6.03246	0
13553.5	10.1095	0
13556.9	14.1838	0
13561.4	18.2551	0
13567	22.3232	0
13573.8	26.3878	0
13581.7	30.4485	0
13590.7	34.4725	0
13600.8	38.2827	0
13611.9	41.6389	0
13623.9	44.7005	0
13636.7	47.5369	0
13650.3	50.2008	0
13664.6	52.7151	0
13679.6	55.0982	0
13695.2	57.3666	0
13711.4	59.535	0
13728.3	61.6148	0
13745.6	63.6264	0
13763.6	65.5729	0
13782.1	67.4615	0
13801.1	69.2957	0
13820.6	71.0769	0
13840.6	72.8064	0
13861	74.4855	0
13881.9	76.1157	0
13903.3	77.6984	0
13925.1	79.235	0
13947.3	79.9297	0
13969.4	79.7775	0
13991.6	79.6256	0

00012044

[Handwritten signature]

[Handwritten mark]

3638



00012945

14013.6	78.5417	0
14034.9	74.5818	0
14055.1	70.6218	0
14074.1	66.6619	0
14092.1	62.7019	0
14109	58.7419	0
14124.7	54.782	0
14139.4	50.822	0
14153	46.862	0
14165.4	42.9021	0
14176.8	38.9421	0
14187.1	34.9822	0
14196.2	31.0222	0
14204.3	27.0622	0
14211.3	23.1023	0
14217.1	19.1423	0
14221.9	15.1824	0
14225.6	11.2224	0
14228.1	7.26254	0
14229.4	3.30407	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230	0	0
14230.1	0.673608	0
14230.9	4.75439	0
14232.7	8.8325	0
14235.7	12.9077	0
14239.8	16.98	0
14245.1	21.0491	0
14251.5	25.1148	0
14259.1	29.1769	0
14267.7	33.2187	0
14277.5	37.1409	0
14288.3	40.6253	0
14300	43.7689	0
14312.6	46.6674	0
14326	49.3841	0
14340	51.9419	0
14354.8	54.3653	0
14370.2	56.6669	0
14386.3	58.8661	0



3639

ALSTOM

00012046

14402.9	60.9708	0
14420.1	63.0033	0
14437.9	64.9698	0
14456.2	66.8757	0
14475.1	68.7268	0
14494.4	70.5245	0
14514.2	72.27	0
14534.5	73.9648	0
14555.3	75.6102	0
14576.6	77.2076	0
14598.2	78.7585	0
14620.3	79.9774	0
14642.5	79.8251	0
14664.6	79.6732	0
14686.8	79.5215	0
14708.4	75.8224	0
14728.9	71.8625	0
14748.3	67.9025	0
14766.6	63.9425	0
14783.8	59.9826	0
14799.9	56.0226	0
14814.9	52.0626	0
14828.8	48.1027	0
14841.7	44.1427	0
14853.4	40.1827	0
14864	36.2228	0
14873.5	32.2628	0
14881.9	28.3029	0
14889.2	24.3429	0
14895.4	20.383	0
14900.5	16.423	0
14904.5	12.463	0
14907.4	8.50312	0
14909.1	4.54386	0
14909.9	0.586567	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910	0	0
14910.6	3.47591	0
14912	7.55525	0
14914.6	11.6313	0

[Handwritten signature]

[Handwritten mark]

3640

ALSTOM

00012947

14918.4	15.7045	0
14923.3	19.7746	0
14929.4	23.8414	0
14936.6	27.9046	0
14944.9	31.9586	0
14954.3	35.9504	0
14964.8	39.5823	0
14976.3	42.8123	0
14988.6	45.7808	0
15001.7	48.5511	0
15015.5	51.1555	0
15030.1	53.62	0
15045.3	55.9572	0
15061.2	58.1878	0
15077.6	60.3201	0
15094.7	62.3737	0
15112.3	64.3607	0
15130.4	66.2846	0
15149.1	68.1527	0
15168.3	69.967	0
15188	71.7287	0
15208.1	73.4392	0
15228.8	75.0999	0
15249.9	76.7122	0
15271.4	78.2775	0
15293.3	79.7972	0
15315.5	79.8728	0
15337.7	79.7207	0
15359.8	79.569	0
15381.7	77.063	0
15402.6	73.1031	0
15422.3	69.1431	0
15441	65.1831	0
15458.5	61.2232	0
15475	57.2632	0
15490.3	53.3033	0
15504.6	49.3433	0
15517.8	45.3833	0
15529.8	41.4234	0
15540.8	37.4634	0
15550.6	33.5035	0
15559.4	29.5435	0
15567	25.5835	0
15573.6	21.6236	0
15579.1	17.6636	0
15583.4	13.7037	0
15586.7	9.74371	0
15588.8	5.78392	0
15589.7	1.82636	0
15590	0	0
15590	0	0
15590	0	0
15590	0	0
15590	0	0
15590	0	0

[Handwritten signature]

[Handwritten mark]

3641



00012048

15590	0	0
15590	0	0
15590	0	0
15590	0	0
15590	0	0
15590	0	0
15590	0	0
15590	0	0
15590	0	0
15590	0	0
15590	0	0
15590.4	2.19743	0
15591.4	6.27763	0
15593.7	10.3546	0
15597.1	14.4287	0
15601.7	18.4998	0
15607.4	22.5677	0
15614.2	26.6321	0
15622.2	30.6923	0
15631.3	34.7124	0
15641.4	38.4962	0
15652.6	41.8302	0
15664.6	44.8764	0
15677.5	47.7017	0
15691.1	50.3558	0
15705.5	52.862	0
15720.5	55.2375	0
15736.1	57.4997	0
15752.4	59.6623	0
15769.3	61.7376	0
15786.7	63.7452	0
15804.7	65.688	0
15823.2	67.5733	0
15842.2	69.4043	0
15861.8	71.1823	0
15881.8	72.9087	0
15902.3	74.5849	0
15923.2	76.2122	0
15944.6	77.7921	0
15966.4	79.3259	0
15988.6	79.9205	0
16010.8	7.98E+01	0
16032.9	79.6165	0
16054.9	78.3037	0
16076.1	74.3437	0
16096.3	70.3837	0
16115.3	66.4238	0
16133.2	62.4638	0
16150	58.5039	0
16165.7	54.5439	0
16180.3	50.5839	0
16193.8	46.624	0
16206.2	42.664	0
16217.5	38.704	0
16227.7	34.7441	0

[Handwritten signature]

[Handwritten mark]

5642

ALSTOM

00012949

16236.8	30.7841	0
16244.8	26.8242	0
16251.7	22.8642	0
16257.5	18.9042	0
16262.2	14.9443	0
16265.8	10.9843	0
16268.2	7.02448	0
16269.4	3.06615	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270	0	0
16270.2	0.918951	0
16270.9	4.99973	0
16272.8	9.0776	0
16275.9	13.1526	0
16280.1	17.2247	0
16285.5	21.2936	0
16291.9	25.3591	0
16299.6	29.4209	0
16308.3	33.4598	0
16318.1	37.3641	0
16329	40.8221	0
16340.8	43.9495	0
16353.4	46.8356	0
16366.8	49.542	0
16380.9	52.0913	0
16395.7	54.5069	0
16411.2	56.8019	0
16427.3	58.9952	0
16443.9	61.0949	0
16461.2	63.1234	0
16479	65.086	0
16497.3	66.9886	0
16516.2	68.8364	0
16535.6	70.6309	0
16555.4	72.3733	0
16575.8	74.0651	0
16596.6	75.7076	0
16617.8	77.3022	0
16639.5	78.8503	0
16661.6	79.9682	0

[Handwritten signature]

[Handwritten mark]

3643

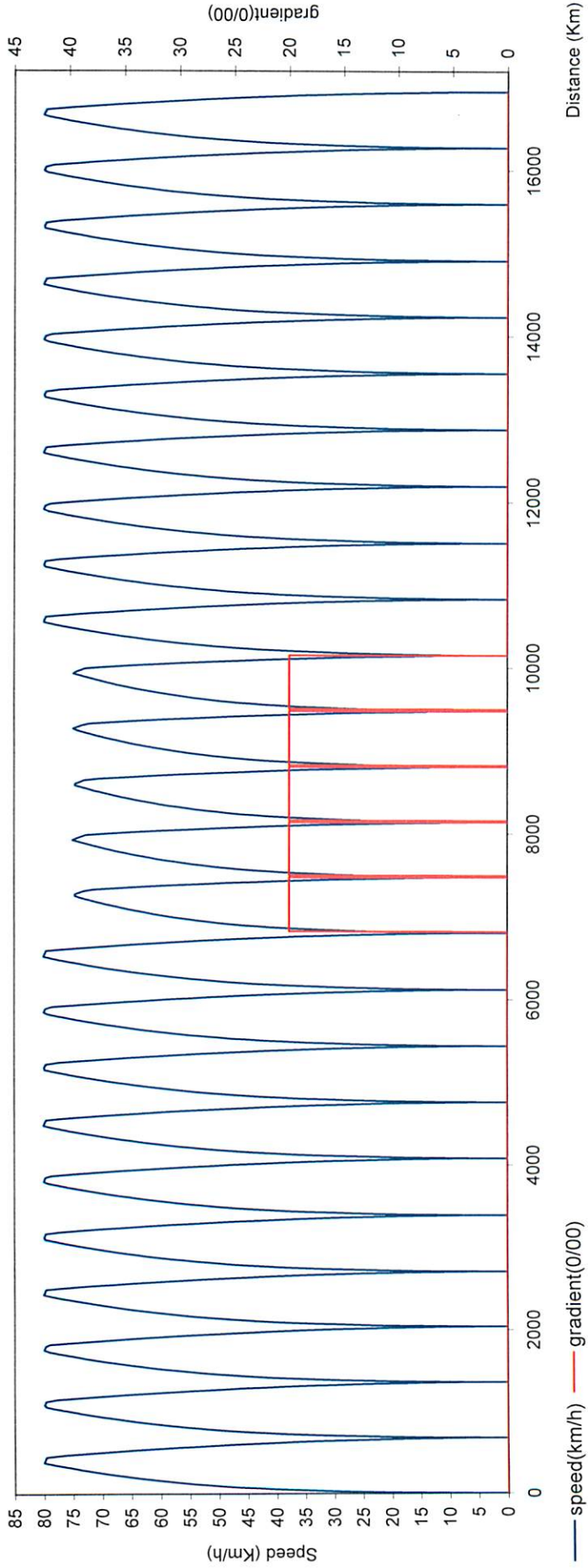


00012950

[illegible]



Graph 1 - Cycle [10 x A1 + 5 x B1 + 10 x A1] Servicio Continuo



00012351

Handwritten signature in blue ink.

Handwritten signature in red ink.

3645



00012052

Cycles for "Servicio de Afluencia"

8X

distance(m)	speed(km/h)	gradient(0/00)
0	0	0
0.726097	3.79596	0
2.11933	7.5902	0
4.75406	11.3815	0
8.43876	15.1702	0
13.174	18.9561	0
18.9629	22.7391	0
25.8054	26.5189	0
33.6964	30.2953	0
42.6331	34.0413	0
52.5966	37.6384	0
63.5043	40.8353	0
75.2572	43.7497	0
87.7892	46.451	0
101.048	48.9932	0
114.994	51.3945	0
129.59	53.6769	0
144.805	55.8493	0
160.609	57.9289	0
176.979	59.9231	0
193.893	61.8446	0
211.332	63.7078	0
229.281	65.5149	0
247.725	67.2718	0
266.65	68.9815	0
286.043	70.6452	0
305.893	72.2638	0
326.186	73.8386	0
346.91	75.3705	0
368.054	76.8608	0
389.607	78.3106	0
411.557	79.721	0
433.695	78.5315	0
454.96	74.5715	0
475.124	70.6116	0
494.188	66.6516	0
512.153	62.6916	0
529.017	58.7317	0
544.781	54.7717	0
559.445	50.8118	0
573.01	46.8518	0
585.474	42.8918	0
596.838	38.9319	0
607.103	34.9719	0
616.266	31.0119	0
624.33	27.052	0
631.294	23.092	0
637.159	19.132	0
641.924	15.1721	0
645.577	11.2121	0
648.135	7.25223	0
649.383	3.29372	0
650	0	0

Dist(m)	Application
0	1:MEXICO DRIVE A2
6500	2:MEXICO DRIVE B2
10125	1:MEXICO DRIVE A2
16625	

133000

5646



00012053

650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650	0	0
650.122	0.636517	0
650.848	4.43247	0
652.502	8.22607	0
655.298	12.0169	0
659.156	15.8052	0
664.07	19.5907	0
670.037	23.3731	0
677.054	27.1524	0
685.121	30.9273	0
694.233	34.6641	0
704.363	38.202	0
715.418	41.3401	0
727.306	44.2164	0
739.963	46.8877	0
753.34	49.4051	0
767.397	51.7852	0
782.099	54.0486	0
797.414	56.2041	0
813.315	58.2692	0
829.778	60.2495	0
846.781	62.161	0
864.307	64.0147	0
882.339	65.8129	0
900.865	67.5618	0
919.869	69.2637	0
939.34	70.9197	0
959.265	72.5309	0
979.631	74.0984	0
1000.43	75.6233	0
1021.64	77.1067	0
1043.26	78.5499	0
1065.28	79.9537	0
1087.34	77.8675	0
1108.42	73.9075	0
1128.4	69.9475	0
1147.28	65.9876	0
1165.06	62.0276	0
1181.74	58.0677	0
1197.32	54.1077	0

3647

ALSTOM

00012054

1211.8	50.1477	0
1225.18	46.1878	0
1237.46	42.2278	0
1248.64	38.2678	0
1258.72	34.3079	0
1267.7	30.3479	0
1275.57	26.388	0
1282.35	22.428	0
1288.04	18.468	0
1292.61	14.5081	0
1296.09	10.5481	0
1298.43	6.58824	0
1299.51	2.63015	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300	0	0
1300.24	1.27303	0
1300.97	5.06899	0
1302.89	8.86194	0
1305.87	12.6524	0
1309.91	16.4402	0
1315	20.2251	0
1321.14	24.0071	0
1328.34	27.7857	0
1336.58	31.5577	0
1345.86	35.2853	0
1356.15	38.7541	0
1367.36	41.8383	0
1379.38	44.6769	0
1392.16	47.3201	0
1405.65	49.8131	0
1419.82	52.1727	0
1434.63	54.4172	0
1450.04	56.5565	0
1466.04	58.6071	0
1482.59	60.5741	0
1499.68	62.4758	0
1517.3	64.32	0
1535.41	66.1095	0
1554.02	67.8504	0
1573.1	69.5445	0





3648



00012955

1592.65	71.193	0
1612.65	72.7968	0
1633.09	74.357	0
1653.96	75.8749	0
1675.24	77.3515	0
1696.92	78.788	0
1719	80	0
1740.95	77.2035	0
1761.84	73.2435	0
1781.64	69.2835	0
1800.34	65.3236	0
1817.93	61.3636	0
1834.43	57.4036	0
1849.82	53.4437	0
1864.12	49.4837	0
1877.31	45.5238	0
1889.41	41.5638	0
1900.4	37.6038	0
1910.3	33.6439	0
1919.09	29.6839	0
1926.79	25.7239	0
1933.38	21.764	0
1938.88	17.804	0
1943.27	13.844	0
1946.56	9.8841	0
1948.73	5.92425	0
1949.63	1.96658	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950	0	0
1950.37	1.90955	0
1951.22	5.70517	0
1953.32	9.49769	0
1956.48	13.2877	0
1960.69	17.075	0
1965.95	20.8595	0
1972.27	24.6409	0
1979.64	28.419	0
1988.06	32.1867	0
1997.52	35.8973	0
2007.97	39.2948	0

5649

ALSTOM

00012056

2019.32	42.33	0
2031.47	45.1315	0
2044.37	47.7483	0
2057.98	50.2172	0
2072.26	52.5569	0
2087.17	54.7827	0
2102.68	56.9063	0
2118.77	58.9426	0
2135.42	60.8971	0
2152.6	62.789	0
2170.3	64.6237	0
2188.5	66.4047	0
2207.19	68.1377	0
2226.35	69.8241	0
2245.97	71.465	0
2266.05	73.0614	0
2286.56	74.6145	0
2307.5	76.1253	0
2328.85	77.5952	0
2350.6	79.025	0
2372.73	80	0
2394.53	76.5394	0
2415.24	72.5795	0
2434.85	68.6195	0
2453.36	64.6596	0
2470.77	60.6996	0
2487.08	56.7396	0
2502.3	52.7797	0
2516.41	48.8197	0
2529.42	44.8597	0
2541.33	40.8998	0
2552.14	36.9398	0
2561.85	32.9798	0
2570.46	29.0199	0
2577.97	25.0599	0
2584.38	21.1	0
2589.69	17.14	0
2593.9	13.18	0
2597.02	9.22009	0
2599.01	5.26031	0
2599.76	1.30301	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0
2600	0	0

3650

ALSTOM

00012057

2600	0	0
2600	0	0
2600	0	0
2600.49	2.54607	0
2601.51	6.34125	0
2603.77	10.1334	0
2607.1	13.923	0
2611.5	17.7098	0
2616.94	21.4938	0
2623.44	25.2747	0
2630.98	29.0522	0
2639.58	32.814	0
2649.21	36.497	0
2659.82	39.8239	0
2671.3	42.8152	0
2683.58	45.581	0
2696.61	48.1724	0
2710.33	50.6177	0
2724.71	52.9379	0
2739.73	55.1452	0
2755.34	57.2538	0
2771.53	59.2757	0
2788.26	61.2184	0
2805.53	63.1006	0
2823.32	64.9259	0
2841.6	66.6986	0
2860.37	68.4237	0
2879.61	70.1024	0
2899.31	71.7358	0
2919.46	73.3248	0
2940.04	74.8707	0
2961.05	76.3747	0
2982.47	77.8377	0
3004.29	79.2609	0
3026.45	79.8354	0
3048.08	75.8754	0
3068.61	71.9155	0
3088.03	67.9555	0
3106.36	63.9955	0
3123.59	60.0356	0
3139.71	56.0756	0
3154.74	52.1156	0
3168.66	48.1557	0
3181.49	44.1957	0
3193.22	40.2358	0
3203.84	36.2758	0
3213.37	32.3158	0
3221.8	28.3559	0
3229.12	24.3959	0
3235.35	20.4359	0
3240.47	16.476	0
3244.49	12.516	0
3247.41	8.55609	0
3249.14	4.59674	0
3249.88	0.639445	0





5651



00012058

3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250	0	0
3250.61	3.18258	0
3251.81	6.97732	0
3254.26	10.769	0
3257.77	14.5581	0
3262.34	18.3446	0
3267.96	22.128	0
3274.63	25.9083	0
3282.35	29.6853	0
3291.12	33.4398	0
3300.92	37.0844	0
3311.68	40.3426	0
3323.3	43.2941	0
3335.71	46.0262	0
3348.86	48.5924	0
3362.7	51.0149	0
3377.19	53.3158	0
3392.31	55.5049	0
3408.02	57.5988	0
3424.3	59.6065	0
3441.12	61.5381	0
3458.48	63.4106	0
3476.35	65.2265	0
3494.71	66.9912	0
3513.56	68.7084	0
3532.88	70.3794	0
3552.66	72.0053	0
3572.88	73.587	0
3593.53	75.1258	0
3614.61	76.6228	0
3636.1	78.0791	0
3657.98	79.4957	0
3680.16	79.1714	0
3701.6	75.2114	0
3721.94	71.2514	0
3741.18	67.2915	0
3759.32	63.3315	0
3776.37	59.3716	0
3792.31	55.4116	0

3652



00012059

3807.15	51.4516	0
3820.89	47.4917	0
3833.53	43.5317	0
3845.08	39.5717	0
3855.52	35.6118	0
3864.86	31.6518	0
3873.1	27.6918	0
3880.24	23.7319	0
3886.28	19.7719	0
3891.23	15.812	0
3895.07	11.852	0
3897.8	7.89209	0
3899.26	3.93317	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	0	0
3900	2.31E-02	0
3900.73	3.8191	0
3902.13	7.61332	0
3904.77	11.4046	0
3908.46	15.1933	0
3913.21	18.9792	0
3919	22.7621	0
3925.85	26.5419	0
3933.75	30.3183	0
3942.69	34.064	0
3952.66	37.6591	0
3963.57	40.8538	0
3975.33	43.7667	0
3987.87	46.467	0
4001.13	49.0082	0
4015.08	51.4088	0
4029.68	53.6905	0
4044.9	55.8622	0
4060.71	57.9413	0
4077.08	59.935	0
4094	61.8561	0
4111.44	63.719	0
4129.39	65.5258	0
4147.84	67.2824	0
4166.77	68.9918	0

3653



4186.16	70.6552	0
4206.02	72.2736	0
4226.31	73.848	0
4247.04	75.3797	0
4268.18	76.8698	0
4289.74	78.3194	0
4311.69	79.7295	0
4333.83	78.5073	0
4355.09	74.5474	0
4375.24	70.5874	0
4394.3	66.6275	0
4412.26	62.6675	0
4429.12	58.7075	0
4444.87	54.7476	0
4459.53	50.7876	0
4473.09	46.8276	0
4485.55	42.8677	0
4496.9	38.9077	0
4507.16	34.9478	0
4516.32	30.9878	0
4524.38	27.0278	0
4531.33	23.0679	0
4537.19	19.1079	0
4541.95	15.1479	0
4545.6	11.188	0
4548.15	7.22809	0
4549.39	3.2696	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550	0	0
4550.13	0.659658	0
4550.85	4.45562	0
4552.52	8.24919	0
4555.32	12.04	0
4559.18	15.8283	0
4564.1	19.6137	0
4570.08	23.3962	0
4577.1	27.1754	0
4585.17	30.9503	0
4594.29	34.6867	0
4604.43	38.2223	0

00012060

5654



00012361

4615.49	41.3583	0
4627.38	44.2332	0
4640.04	46.9035	0
4653.42	49.42	0
4667.49	51.7993	0
4682.19	54.0621	0
4697.51	56.2169	0
4713.41	58.2815	0
4729.88	60.2613	0
4746.89	62.1725	0
4764.42	64.0258	0
4782.45	65.8237	0
4800.98	67.5723	0
4819.99	69.2739	0
4839.46	70.9297	0
4859.39	72.5406	0
4879.76	74.1078	0
4900.55	75.6325	0
4921.77	77.1157	0
4943.39	78.5585	0
4965.41	79.9621	0
4987.47	77.8433	0
5008.54	73.8834	0
5028.52	69.9234	0
5047.39	65.9635	0
5065.16	62.0035	0
5081.84	58.0435	0
5097.41	54.0836	0
5111.88	50.1236	0
5125.25	46.1636	0
5137.53	42.2037	0
5148.7	38.2437	0
5158.77	34.2837	0
5167.75	30.3238	0
5175.62	26.3638	0
5182.39	22.4038	0
5188.07	18.4439	0
5192.63	14.4839	0
5196.11	10.524	0
5198.45	6.5641	0
5199.51	2.60603	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0
5200	0	0

3655



00012362

5200	0	0
5200	0	0
5200	0	0
5200.25	1.29617	0
5200.97	5.09213	0
5202.9	8.88506	0
5205.89	12.6755	0
5209.93	16.4633	0
5215.03	20.2482	0
5221.18	24.0301	0
5228.38	27.8088	0
5236.63	31.5806	0
5245.92	35.3079	0
5256.22	38.7739	0
5267.43	41.8563	0
5279.45	44.6936	0
5292.24	47.3357	0
5305.74	49.8278	0
5319.91	52.1867	0
5334.72	54.4305	0
5350.14	56.5692	0
5366.14	58.6193	0
5382.69	60.5859	0
5399.79	62.4872	0
5417.4	64.3311	0
5435.52	66.1202	0
5454.13	67.8609	0
5473.22	69.5547	0
5492.77	71.2029	0
5512.77	72.8064	0
5533.21	74.3664	0
5554.08	75.884	0
5575.37	77.3604	0
5597.06	78.7966	0
5619.14	80	0
5641.08	77.1793	0
5661.97	73.2194	0
5681.76	69.2594	0
5700.45	65.2994	0
5718.03	61.3395	0
5734.52	57.3795	0
5749.91	53.4195	0
5764.2	49.4596	0
5777.39	45.4996	0
5789.48	41.5397	0
5800.47	37.5797	0
5810.35	33.6197	0
5819.14	29.6598	0
5826.83	25.6998	0
5833.42	21.7398	0
5838.91	17.7799	0
5843.29	13.8199	0
5846.57	9.85996	0
5848.75	5.90011	0
5849.64	1.94246	0

3656

ALSTOM

00012363

5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850	0	0
5850.37	1.93269	0
5851.23	5.7283	0
5853.33	9.5208	0
5856.5	13.3108	0
5860.72	17.0981	0
5865.99	20.8826	0
5872.32	24.664	0
5879.69	28.442	0
5888.12	32.2095	0
5897.58	35.9193	0
5908.04	39.3142	0
5919.39	42.3477	0
5931.54	45.148	0
5944.45	47.7638	0
5958.07	50.2318	0
5972.35	52.5708	0
5987.26	54.7959	0
6002.78	56.919	0
6018.87	58.9547	0
6035.52	60.9088	0
6052.71	62.8004	0
6070.41	64.6347	0
6088.61	66.4154	0
6107.3	68.1481	0
6126.47	69.8342	0
6146.09	71.4749	0
6166.17	73.071	0
6186.68	74.6238	0
6207.62	76.1344	0
6228.98	77.604	0
6250.73	79.0336	0
6272.86	80	0
6294.72	76.7811	0
6315.5	72.8212	0
6335.18	68.8612	0
6353.76	64.9012	0
6371.23	60.9413	0
6387.61	56.9813	0



00012964

6402.89	53.0214	0
6417.07	49.0614	0
6430.15	45.1014	0
6442.12	41.1415	0
6453	37.1788	0
6462.78	33.1795	0
6471.43	29.1375	0
6478.96	25.0582	0
6485.35	20.9464	0
6490.59	16.8077	0
6494.68	12.6474	0
6497.6	8.47086	0
6499.22	4.28418	0
6499.98	9.52E-02	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500	0	0
6500.69	3.47874	0
6501.94	7.03441	0
6504.39	10.5777	0
6507.81	14.1052	0
6512.22	17.6121	0
6517.59	21.0935	0
6523.93	24.5451	20
6531.22	27.962	20
6539.46	31.3373	20
6548.63	34.6332	20
6558.68	37.7173	20
6569.54	40.3996	20
6581.1	42.7842	20
6593.29	44.9384	20
6606.05	46.9347	20
6619.35	48.8179	20
6633.16	50.5954	20
6647.45	52.2829	20
6662.2	53.8882	20
6677.38	55.4157	20
6692.98	56.8772	20
6708.98	58.2785	20
6725.35	59.6222	20
6742.1	60.9141	20

[Handwritten signature]

[Handwritten mark]

6658



6759.19	62.1661	20
6776.63	63.3803	20
6794.4	64.5578	20
6812.49	65.7003	20
6830.9	66.8118	20
6849.61	67.8935	20
6868.61	68.9461	20
6887.91	69.9704	20
6907.48	70.9671	20
6927.33	71.9368	20
6947.44	72.8801	20
6967.82	73.7979	20
6988.44	74.6907	20
7009.21	74.4999	20
7029.8	73.7151	20
7050.17	72.9317	20
7070.3	71.3655	20
7089.48	66.7568	20
7107.38	62.1482	20
7124.01	57.5396	20
7139.35	52.931	20
7153.41	48.3223	20
7166.2	43.739	20
7177.72	39.2096	20
7187.98	34.6936	20
7196.99	30.1777	20
7204.74	25.6617	20
7211.24	21.1457	20
7216.49	16.6298	20
7220.47	12.1138	20
7223.2	7.59793	20
7224.46	3.08358	20
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225	0	0
7225.21	1.02634	0
7225.88	4.26631	0
7227.44	7.50403	0
7229.95	10.7395	0
7233.39	13.9728	0
7237.72	17.2038	0

00012065



3659



7242.94	20.4324	0
7249.06	23.6583	20
7256.08	26.8815	20
7264	30.1019	20
7272.8	33.2983	20
7282.49	36.4194	20
7293.01	39.2298	20
7304.25	41.7159	20
7316.16	43.9575	20
7328.66	46.0148	20
7341.71	47.9501	20
7355.29	49.7759	20
7369.36	51.5035	20
7383.89	53.1468	20
7398.87	54.7101	20
7414.28	56.2008	20
7430.09	57.6299	20
7446.29	59.0003	20
7462.86	60.3147	20
7479.79	61.5849	20
7497.07	62.8167	20
7514.69	64.0112	20
7532.63	65.1696	20
7550.89	66.2954	20
7569.46	67.3909	20
7588.33	68.457	20
7607.49	69.4945	20
7626.93	70.504	20
7646.66	71.4862	20
7666.65	72.4418	20
7686.9	73.3714	20
7707.41	74.2759	20
7728.15	74.8809	20
7748.85	74.0955	20
7769.32	73.3115	20
7789.57	72.5287	20
7809.12	68.075	20
7827.39	63.4663	20
7844.38	58.8577	20
7860.09	54.2491	20
7874.52	49.6405	20
7887.67	45.0439	20
7899.55	40.5012	20
7910.17	35.9852	20
7919.54	31.4693	20
7927.65	26.9533	20
7934.51	22.4374	20
7940.12	17.9214	20
7944.46	13.4055	20
7947.54	8.88953	20
7949.23	4.37445	20
7950	0	0
7950	0	0
7950	0	0
7950	0	0

00012966

3667



00012967

7950	0	0
7950	0	0
7950	0	0
7950	0	0
7950	0	0
7950	0	0
7950	0	0
7950	0	0
7950	0	0
7950	0	0
7950	0	0
7950	0	0
7950	0	0
7950.02	9.97E-02	0
7950.69	3.33963	0
7951.87	6.57828	0
7954.14	9.81434	0
7957.32	13.0483	0
7961.39	16.2799	0
7966.36	19.5092	0
7972.22	22.7359	20
7978.98	25.9599	20
7986.64	29.1811	20
7995.19	32.3889	20
8004.63	35.5491	20
8014.92	38.4614	20
8025.97	41.0319	20
8037.69	43.3394	20
8050.02	45.4403	20
8062.92	47.408	20
8076.35	49.2645	20
8090.28	51.0182	20
8104.69	52.6851	20
8119.54	54.2709	20
8134.83	55.7809	20
8150.53	57.2272	20
8166.62	58.6142	20
8183.09	59.9442	20
8199.92	61.2256	20
8217.1	62.4682	20
8234.62	63.6733	20
8252.47	64.8419	20
8270.64	65.9765	20
8289.12	67.0806	20
8307.9	68.155	20
8326.98	69.2006	20
8346.34	70.2181	20
8365.99	71.2081	20
8385.9	72.1712	20
8406.08	73.1082	20
8426.51	74.0197	20
8447.2	74.9065	20
8467.95	74.32	20
8488.49	73.5356	20
8508.8	72.7524	20

3661



00012368

8528.66	69.3931	20
8547.3	64.7845	20
8564.65	60.1759	20
8580.73	55.5672	20
8595.52	50.9586	20
8609.04	46.3536	20
8621.28	41.7949	20
8632.26	37.2769	20
8641.99	32.7609	20
8650.46	28.245	20
8657.68	23.729	20
8663.64	19.213	20
8668.35	14.6971	20
8671.8	10.1811	20
8674.01	5.66532	20
8674.8	1.15203	20
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675	0	0
8675.5	2.41295	0
8676.41	5.6523	0
8678.41	8.88898	0
8681.32	12.1235	0
8685.13	15.3559	0
8689.84	18.5859	0
8695.45	21.8133	20
8701.96	25.0381	20
8709.36	28.2601	20
8717.66	31.4756	20
8726.84	34.652	20
8736.89	37.6652	20
8747.74	40.3277	20
8759.27	42.7033	20
8771.44	44.8558	20
8784.18	46.8568	20
8797.46	48.7445	20
8811.25	50.526	20
8825.52	52.2168	20
8840.25	53.8254	20
8855.42	55.3559	20
8871	56.8198	20

3662

ALSTOM

00012369

8886.98	58.2235	20
8903.34	59.5694	20
8920.07	60.8631	20
8937.15	62.1167	20
8954.57	63.3324	20
8972.33	64.5113	20
8990.41	65.6551	20
9008.8	66.7679	20
9027.5	67.8507	20
9046.49	68.9045	20
9065.78	69.9299	20
9085.34	70.9277	20
9105.18	71.8984	20
9125.28	72.8428	20
9145.64	73.7616	20
9166.26	74.6554	20
9187.04	74.5446	20
9207.63	73.7598	20
9228.01	72.9763	20
9248.1	70.7112	20
9267.1	66.1026	20
9284.82	61.494	20
9301.26	56.8854	20
9316.42	52.2767	20
9330.3	47.6682	20
9342.91	43.093	20
9354.25	38.5685	20
9364.33	34.0525	20
9373.17	29.5366	20
9380.74	25.0206	20
9387.07	20.5047	20
9392.13	15.9887	20
9395.95	11.4728	20
9398.47	6.95689	20
9399.57	2.4429	20
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400	0	0
9400.31	1.48627	0
9400.98	4.72624	0
9402.74	7.96346	0





3663

ALSTOM

00012970

9405.39	11.1986	0
9408.94	14.4316	0
9413.4	17.6623	0
9418.76	20.8905	0
9425	24.1161	20
9432.15	27.3389	20
9440.19	30.5584	20
9449.13	33.7483	20
9458.93	36.8402	20
9469.56	39.6008	20
9480.91	42.0483	20
9492.9	44.2588	20
9505.48	46.2964	20
9518.61	48.2158	20
9532.25	50.0266	20
9546.39	51.7418	20
9560.99	53.3735	20
9576.04	54.9258	20
9591.5	56.4073	20
9607.37	57.8279	20
9623.62	59.1902	20
9640.25	60.4974	20
9657.23	61.7621	20
9674.55	62.9885	20
9692.22	64.1778	20
9710.21	65.3313	20
9728.51	66.4527	20
9747.12	67.544	20
9766.03	68.606	20
9785.23	69.6395	20
9804.72	70.6451	20
9824.48	71.6235	20
9844.51	72.5753	20
9864.79	73.5014	20
9885.34	74.4022	20
9906.1	74.7693	20
9926.76	73.9841	20
9947.21	73.2003	20
9967.42	71.736	20
9986.7	67.1274	20
10004.7	62.5187	20
10021.4	57.9101	20
10036.9	53.3015	20
10051	48.6929	20
10063.9	44.1006	20
10075.6	39.5631	20
10085.9	35.0765	20
10095	30.6351	20
10102.9	26.2331	20
10109.6	21.8649	20
10115.1	17.5247	20
10119.3	13.2073	20
10122.4	8.90679	20
10124.2	4.61843	20
10124.9	0.336812	20







00012971

10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125	0	0
10125.6	3.2028	0
10126.8	6.68008	0
10129.1	10.1633	0
10132.4	13.6574	0
10136.7	17.1664	0
10142	20.6949	0
10148.2	24.2473	0
10155.4	27.8277	0
10163.7	31.4378	0
10172.9	35.0462	0
10183.1	38.4706	0
10194.2	41.5561	0
10206.2	44.4161	0
10218.9	47.075	0
10232.3	49.5818	0
10246.4	51.9529	0
10261.2	54.2082	0
10276.5	56.3566	0
10292.5	58.4154	0
10309	60.3899	0
10326	62.2972	0
10343.6	64.1468	0
10361.7	65.9412	0
10380.2	67.6866	0
10399.3	69.3851	0
10418.8	71.0379	0
10438.7	72.6459	0
10459.1	74.2103	0
10479.9	75.7321	0
10501.2	77.2126	0
10522.8	78.6528	0
10544.9	79.9999	0
10566.8	77.0468	0
10587.6	73.0869	0
10607.4	69.1269	0
10626.1	65.1669	0
10643.6	61.207	0
10660.1	57.247	0

[Handwritten signature]

[Handwritten signature]

3665



-- 00012972

10675.4	53.287	0
10689.7	49.3271	0
10702.8	45.3671	0
10714.9	41.4072	0
10725.8	37.4472	0
10735.7	33.4872	0
10744.4	29.5273	0
10752.1	25.5673	0
10758.6	21.6073	0
10764.1	17.6474	0
10768.4	13.6874	0
10771.7	9.72746	0
10773.8	5.76762	0
10774.7	1.81005	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775	0	0
10775.4	2.0597	0
10776.3	5.85522	0
10778.4	9.64764	0
10781.6	13.4376	0
10785.9	17.2248	0
10791.2	21.0092	0
10797.5	24.7904	0
10805	28.5684	0
10813.4	32.3348	0
10822.9	36.0402	0
10833.4	39.4203	0
10844.8	42.445	0
10857	45.2381	0
10869.9	47.8488	0
10883.5	50.3119	0
10897.8	52.6471	0
10912.8	54.8685	0
10928.3	56.9885	0
10944.4	59.0213	0
10961.1	60.973	0
10978.3	62.8627	0
10996	64.6952	0
11014.2	66.4742	0
11032.9	68.2053	0



11052.1	69.8899	0
11071.8	71.529	0
11091.8	73.1237	0
11112.4	74.675	0
11133.3	76.1843	0
11154.7	77.6525	0
11176.5	79.0807	0
11198.6	80	0
11220.4	76.3828	0
11241	72.4228	0
11260.6	68.4629	0
11279.1	64.5029	0
11296.4	60.543	0
11312.7	56.583	0
11327.9	52.623	0
11341.9	48.6631	0
11354.9	44.7031	0
11366.8	40.7431	0
11377.5	36.7832	0
11387.2	32.8232	0
11395.8	28.8632	0
11403.2	24.9033	0
11409.6	20.9433	0
11414.9	16.9834	0
11419	13.0234	0
11422.1	9.06345	0
11424	5.10377	0
11424.8	1.14648	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425	0	0
11425.5	2.69622	0
11426.6	6.49129	0
11428.9	10.2833	0
11432.3	14.0728	0
11436.7	17.8596	0
11442.2	21.6434	0
11448.7	25.4242	0
11456.3	29.2016	0
11464.9	32.9618	0
11474.6	36.6365	0

00012373

3667



12075	0	0
12075	0	0
12075	0	0
12075	0	0
12075.6	3.33273	0
12076.9	7.12737	0
12079.4	10.9189	0
12082.9	14.708	0
12087.5	18.4943	0
12093.2	22.2776	0
12099.9	26.0578	0
12107.7	29.8346	0
12116.5	33.5872	0
12126.3	37.2209	0
12137.1	40.4639	0
12148.8	43.4062	0
12161.2	46.1305	0
12174.4	48.6908	0
12188.3	51.1081	0
12202.8	53.4045	0
12217.9	55.5895	0
12233.6	57.6798	0
12250	59.6842	0
12266.8	61.6132	0
12284.2	63.4835	0
12302.1	65.2973	0
12320.4	67.06	0
12339.3	68.7753	0
12358.7	70.4446	0
12378.4	72.0687	0
12398.7	73.6487	0
12419.4	75.1858	0
12440.5	76.6812	0
12462	78.1359	0
12483.9	79.551	0
12506	79.0147	0
12527.4	75.0548	0
12547.7	71.0948	0
12566.9	67.1348	0
12585	63.1749	0
12602	59.2149	0
12617.9	55.255	0
12632.7	51.295	0
12646.4	47.335	0
12659	43.3751	0
12670.5	39.4151	0
12680.9	35.4551	0
12690.2	31.4952	0
12698.4	27.5352	0
12705.5	23.5752	0
12711.5	19.6153	0
12716.4	15.6553	0
12720.2	11.6954	0
12722.9	7.73546	0
12724.3	3.77664	0

00012375

5/1

3669

ALSTOM

00012276

12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0	0
12725	0.173291	0
12725.8	3.96925	0
12727.2	7.76332	0
12729.9	11.5545	0
12733.6	15.3431	0
12738.4	19.1289	0
12744.3	22.9117	0
12751.1	26.6913	0
12759.1	30.4676	0
12768.1	34.2111	0
12778.1	37.7934	0
12789	40.9736	0
12800.8	43.8774	0
12813.4	46.5703	0
12826.7	49.1057	0
12840.6	51.5012	0
12855.3	53.7784	0
12870.5	55.9461	0
12886.3	58.0218	0
12902.7	60.0121	0
12919.7	61.9309	0
12937.1	63.7916	0
12955.1	65.5962	0
12973.6	67.3509	0
12992.5	69.0584	0
13011.9	70.7201	0
13031.8	72.3367	0
13052.1	73.9094	0
13072.9	75.4394	0
13094	76.9279	0
13115.6	78.3759	0
13137.6	79.7844	0
13159.7	78.3507	0
13180.9	74.3907	0
13201	70.4308	0
13220	66.4708	0
13237.9	62.5109	0
13254.8	58.5509	0





3679

SIMULACIONES, CALCULOS Y GRÁFICAS



13270.5	54.5909	0
13285.1	50.631	0
13298.6	46.671	0
13311	42.711	0
13322.3	38.7511	0
13332.5	34.7911	0
13341.7	30.8312	0
13349.7	26.8712	0
13356.6	22.9112	0
13362.4	18.9513	0
13367.1	14.9913	0
13370.7	11.0314	0
13373.2	7.07146	0
13374.4	3.11307	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375	0	0
13375.2	0.809807	0
13375.9	4.60577	0
13377.6	8.39918	0
13380.5	12.1899	0
13384.4	15.9781	0
13389.3	19.7634	0
13395.3	23.5457	0
13402.4	27.3248	0
13410.5	31.0991	0
13419.7	34.8334	0
13429.8	38.3536	0
13440.9	41.4766	0
13452.9	44.3424	0
13465.6	47.0058	0
13479	49.5166	0
13493.1	51.891	0
13507.8	54.1493	0
13523.1	56.3003	0
13539.1	58.3614	0
13555.5	60.338	0
13572.6	62.2469	0
13590.1	64.098	0
13608.2	65.8938	0
13626.7	67.6405	0

00012377

3671



13645.7	69.3402	0
13665.2	70.9942	0
13685.2	72.6034	0
13705.6	74.1689	0
13726.4	75.6919	0
13747.6	77.1735	0
13769.3	78.6148	0
13791.3	79.9992	0
13813.3	77.6867	0
13834.4	73.7267	0
13854.3	69.7668	0
13873.1	65.8068	0
13890.8	61.8469	0
13907.5	57.8869	0
13923	53.9269	0
13937.4	49.967	0
13950.8	46.007	0
13963	42.047	0
13974.1	38.0871	0
13984.2	34.1271	0
13993.1	30.1671	0
14000.9	26.2072	0
14007.6	22.2472	0
14013.3	18.2872	0
14017.8	14.3273	0
14021.2	10.3673	0
14023.5	6.40747	0
14024.5	2.4495	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025	0	0
14025.3	1.44632	0
14026	5.24227	0
14028	9.03505	0
14031	12.8254	0
14035.1	16.613	0
14040.3	20.3979	0
14046.4	24.1796	0
14053.7	27.9582	0
14062	31.7292	0
14071.3	35.453	0

00012378

[Handwritten signature]

[Handwritten signature]

3672



14081.6	38.9022	0
14092.9	41.9729	0
14104.9	44.8014	0
14117.8	47.4371	0
14131.3	49.9235	0
14145.5	52.2776	0
14160.3	54.517	0
14175.8	56.652	0
14191.8	58.6986	0
14208.4	60.6622	0
14225.5	62.5613	0
14243.1	64.4029	0
14261.3	66.19	0
14279.9	67.9287	0
14299	69.6208	0
14318.6	71.2672	0
14338.6	72.8689	0
14359	74.4272	0
14379.9	75.9432	0
14401.2	77.418	0
14422.9	78.8526	0
14445	80	0
14466.9	77.0227	0
14487.8	73.0627	0
14507.5	69.1028	0
14526.2	65.1428	0
14543.7	61.1828	0
14560.2	57.2229	0
14575.5	53.2629	0
14589.7	49.3029	0
14602.9	45.343	0
14614.9	41.383	0
14625.9	37.423	0
14635.7	33.4631	0
14644.5	29.5031	0
14652.1	25.5432	0
14658.7	21.5832	0
14664.1	17.6232	0
14668.4	13.6633	0
14671.7	9.70332	0
14673.8	5.74348	0
14674.7	1.78593	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675	0	0

00012079

3673

ALSTOM

00012380

14675	0	0
14675	0	0
14675	0	0
14675	0	0
14675.4	2.08284	0
14676.3	5.87834	0
14678.4	9.67076	0
14681.6	13.4607	0
14685.9	17.2479	0
14691.2	21.0322	0
14697.6	24.8135	0
14705	28.5914	0
14713.5	32.3576	0
14723	36.0622	0
14733.5	39.4396	0
14744.9	42.4628	0
14757	45.2545	0
14770	47.8643	0
14783.6	50.3265	0
14797.9	52.661	0
14812.9	54.8817	0
14828.4	57.0012	0
14844.5	59.0335	0
14861.2	60.9847	0
14878.4	62.874	0
14896.1	64.7062	0
14914.3	66.4849	0
14933	68.2157	0
14952.2	69.9	0
14971.9	71.5388	0
14992	73.1333	0
15012.5	74.6844	0
15033.5	76.1933	0
15054.8	77.6613	0
15076.6	79.0893	0
15098.7	80	0
15120.5	76.3587	0
15141.2	72.3987	0
15160.7	68.4387	0
15179.2	64.4788	0
15196.5	60.5188	0
15212.8	56.5589	0
15228	52.5989	0
15242	48.6389	0
15255	44.679	0
15266.8	40.719	0
15277.6	36.759	0
15287.3	32.7991	0
15295.8	28.8391	0
15303.3	24.8791	0
15309.6	20.9192	0
15314.9	16.9592	0
15319.1	12.9993	0
15322.1	9.03931	0
15324	5.07965	0

[Handwritten signature]

[Handwritten mark]

3674



00012081

15324.8	1.12236	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325	0	0
15325.5	2.71936	0
15326.6	6.51442	0
15328.9	10.3065	0
15332.3	14.0959	0
15336.7	17.8826	0
15342.2	21.6665	0
15348.8	25.4472	0
15356.4	29.2246	0
15365	32.9846	0
15374.7	36.658	0
15385.3	39.966	0
15396.8	42.9463	0
15409.2	45.7027	0
15422.2	48.2871	0
15436	50.7262	0
15450.4	53.0411	0
15465.4	55.2434	0
15481.1	57.348	0
15497.3	59.366	0
15514	6.13E+01	0
15531.3	63.1852	0
15549.1	65.0079	0
15567.4	66.7784	0
15586.2	68.5013	0
15605.5	70.1779	0
15625.2	71.8093	0
15645.4	73.3963	0
15666	74.9403	0
15687	76.4423	0
15708.5	77.9035	0
15730.3	79.3249	0
15752.5	79.6546	0
15774	75.6946	0
15794.5	71.7347	0
15813.9	67.7747	0
15832.2	63.8148	0
15849.3	59.8548	0

3675

ALSTOM

00012382

15865.4	55.8948	0
15880.4	51.9349	0
15894.3	47.9749	0
15907.1	44.0149	0
15918.7	40.055	0
15929.3	36.095	0
15938.8	32.1351	0
15947.2	28.1751	0
15954.4	24.2151	0
15960.6	20.2552	0
15965.7	16.2952	0
15969.7	12.3352	0
15972.5	8.37531	0
15974.2	4.41608	0
15974.9	0.458789	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975	0	0
15975.6	3.35587	0
15976.9	7.15049	0
15979.4	10.942	0
15983	14.7311	0
15987.6	18.5173	0
15993.2	22.3007	0
16000	26.0808	0
16007.7	29.8577	0
16016.5	33.6099	0
16026.4	37.2418	0
16037.2	40.4825	0
16048.9	43.4235	0
16061.3	46.1466	0
16074.5	48.7059	0
16088.3	51.1224	0
16102.9	53.4181	0
16118	55.6025	0
16133.7	57.6923	0
16150.1	59.6962	0
16166.9	61.6248	0
16184.3	63.4947	0
16202.2	65.3082	0
16220.6	67.0706	0

[Handwritten signature]

[Handwritten mark]



00012383

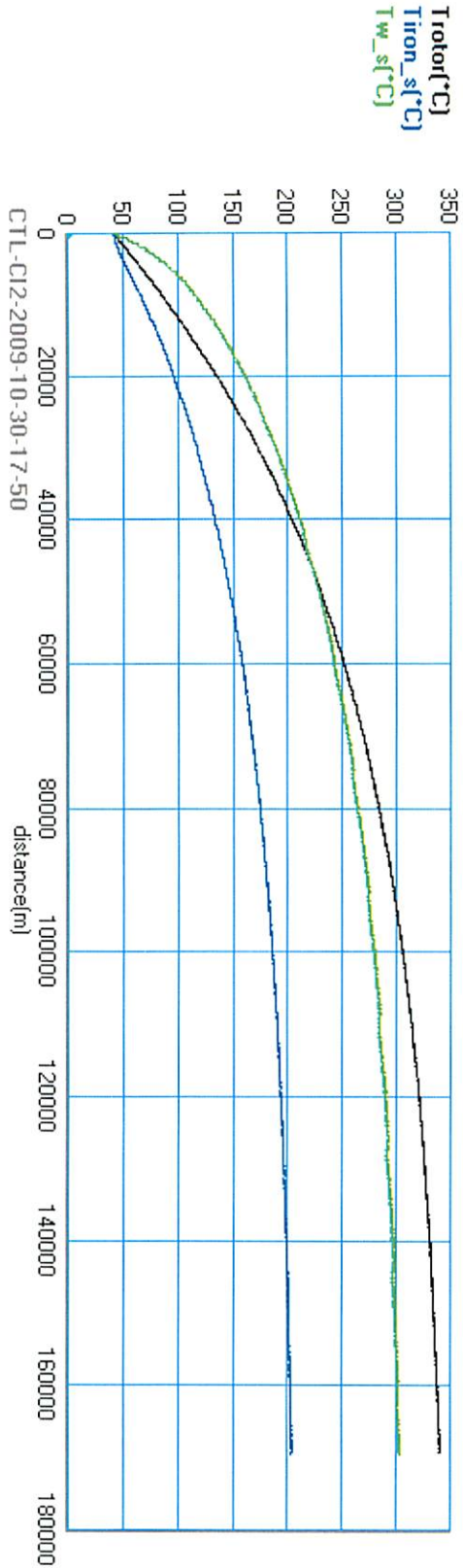
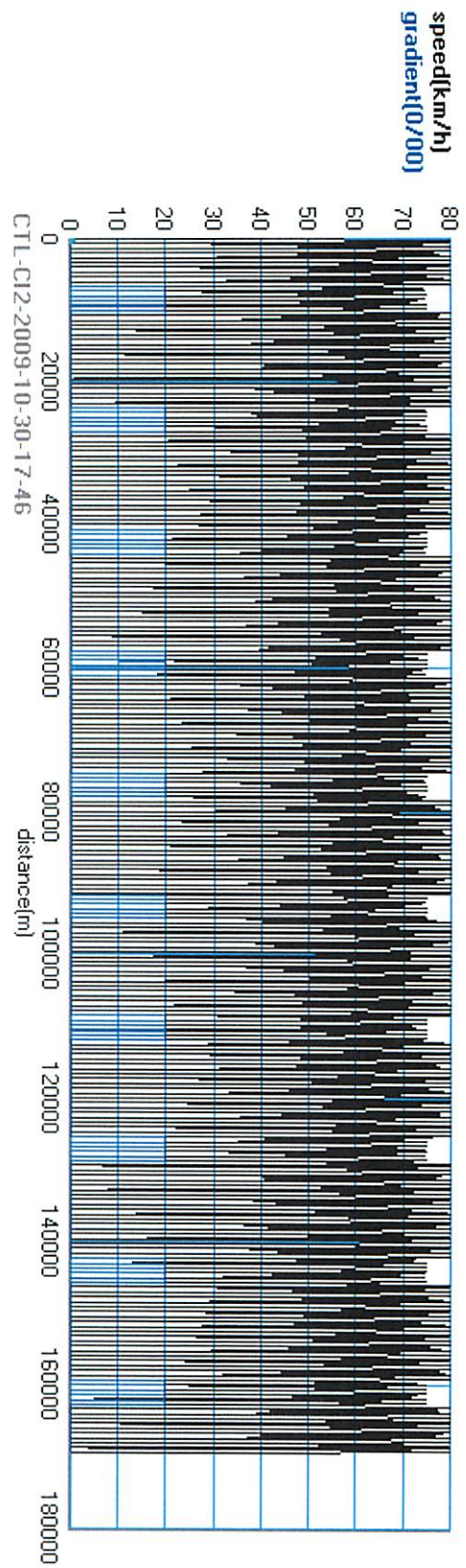
16239.4	68.7857	0
16258.8	70.4546	0
16278.6	72.0784	0
16298.8	73.6582	0
16319.5	75.1951	0
16340.6	76.6901	0
16362.1	78.1446	0
16384	79.5595	0
16406.2	78.9906	0
16427.6	75.0306	0
16447.8	71.0707	0
16467	67.1107	0
16485.1	63.1507	0
16502.1	59.1908	0
16518	55.2308	0
16532.8	51.2709	0
16546.5	47.3109	0
16559.1	43.3509	0
16570.6	39.391	0
16581	35.431	0
16590.3	31.471	0
16598.5	27.5111	0
16605.5	23.5511	0
16611.5	19.5911	0
16616.4	15.6312	0
16620.2	11.6712	0
16622.9	7.71131	0
16624.3	3.75251	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0
16625	0	0



00012384

SERVICIO CONTINUO

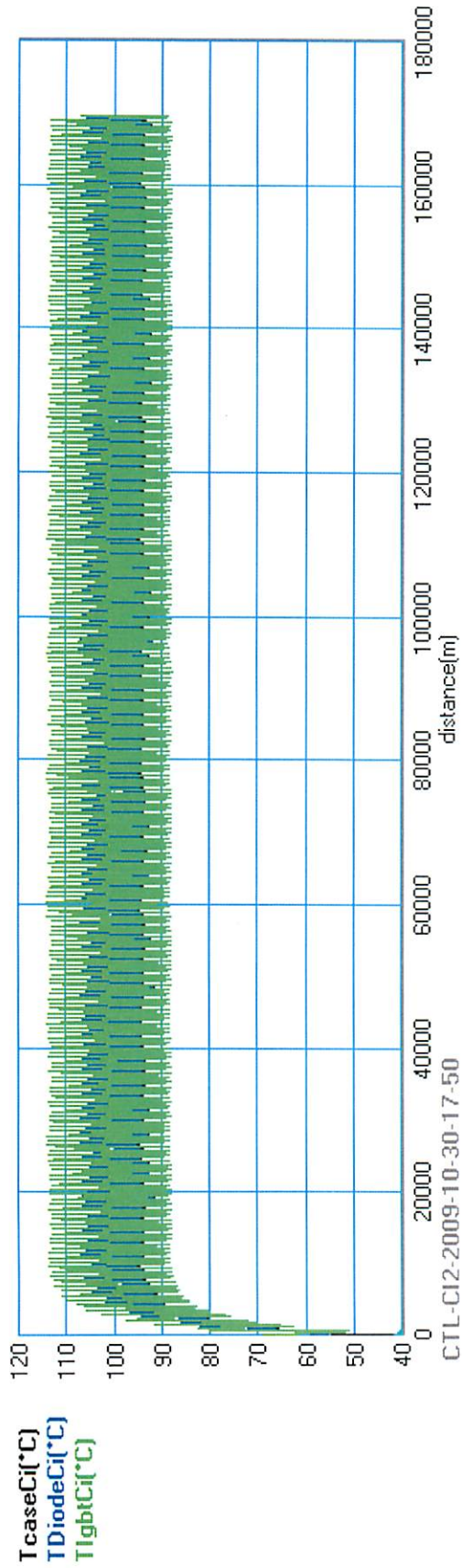
	Dist(m)	Application
1	0	1:MEXICO DRIVE A1
2	6800	2:MEXICO DRIVE B1
3	10150	1:MEXICO DRIVE A1
4	16950	1:MEXICO DRIVE A1
5	23750	2:MEXICO DRIVE B1
6	27100	1:MEXICO DRIVE A1
7	33900	1:MEXICO DRIVE A1
8	40700	2:MEXICO DRIVE B1
9	44050	1:MEXICO DRIVE A1
10	50850	1:MEXICO DRIVE A1
11	57650	2:MEXICO DRIVE B1
12	61000	1:MEXICO DRIVE A1
13	67800	1:MEXICO DRIVE A1
14	74600	2:MEXICO DRIVE B1
15	77950	1:MEXICO DRIVE A1
16	84750	1:MEXICO DRIVE A1
17	91550	2:MEXICO DRIVE B1
18	94900	1:MEXICO DRIVE A1
19	101700	1:MEXICO DRIVE A1
20	108500	2:MEXICO DRIVE B1
21	111850	1:MEXICO DRIVE A1
22	118650	1:MEXICO DRIVE A1
23	125450	2:MEXICO DRIVE B1
24	128800	1:MEXICO DRIVE A1
25	135600	1:MEXICO DRIVE A1
26	142400	2:MEXICO DRIVE B1
27	145750	1:MEXICO DRIVE A1
28	152550	1:MEXICO DRIVE A1
29	159350	2:MEXICO DRIVE B1
30	162700	1:MEXICO DRIVE A1
31	169500	



T_rotor(°C)	T_iron_s(°C)	T_w_s(°C)
341.2	204.0	304.0

3679

00012005



TcaseCi(°C)	TDiodeCi(°C)	TIgbtCi(°C)
99.1	109.1	114.2

3689

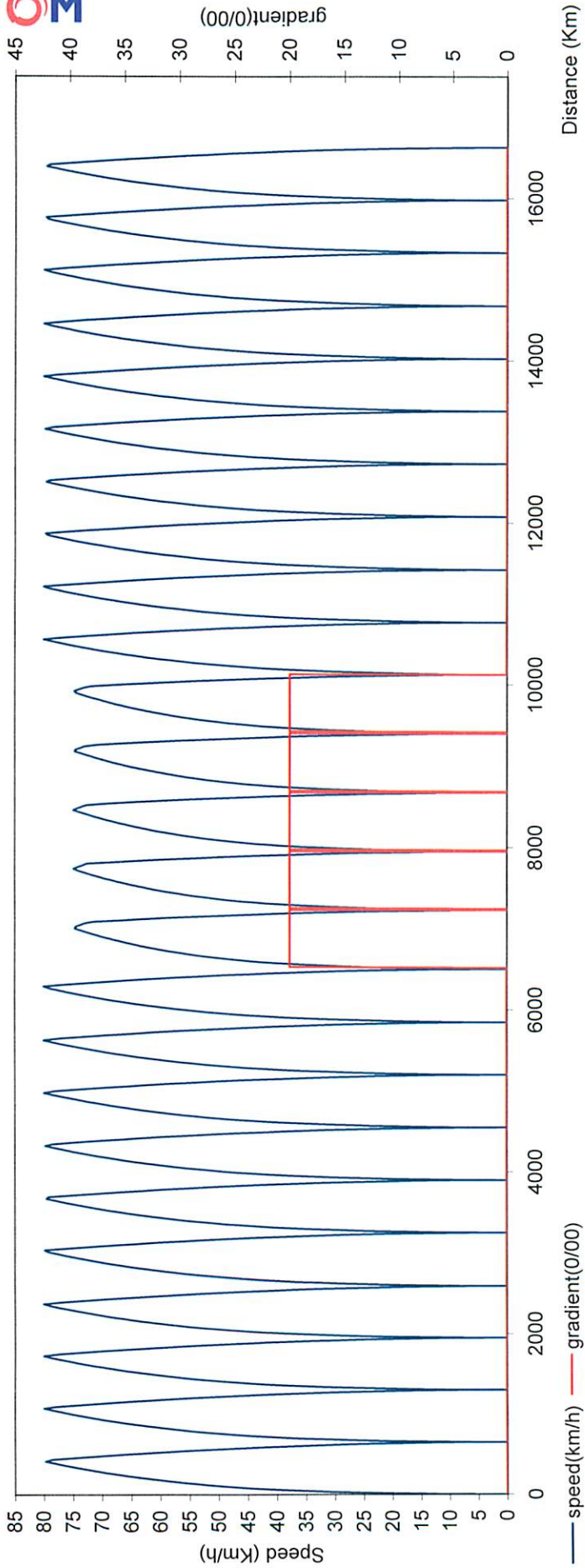
5/10

OK

- 00012086



Graph 2 - Cycle [10 x A2 + 5 x B2 + 10 x A2] Servicio de afluencia



3681

[Handwritten signature]

[Handwritten mark]

[Handwritten line]

00012087

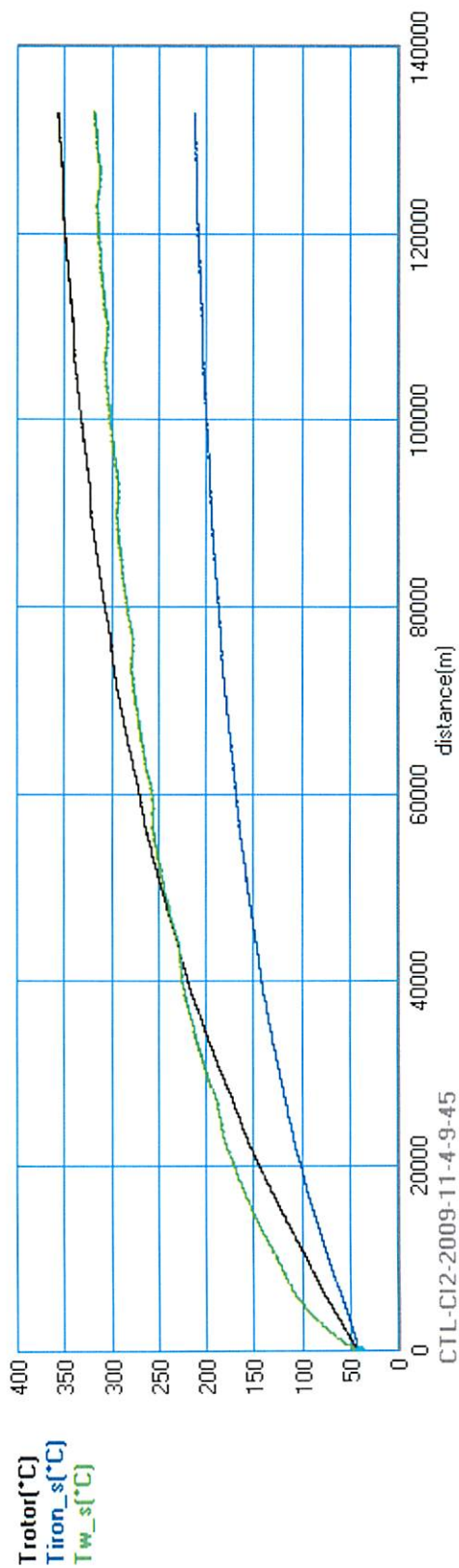
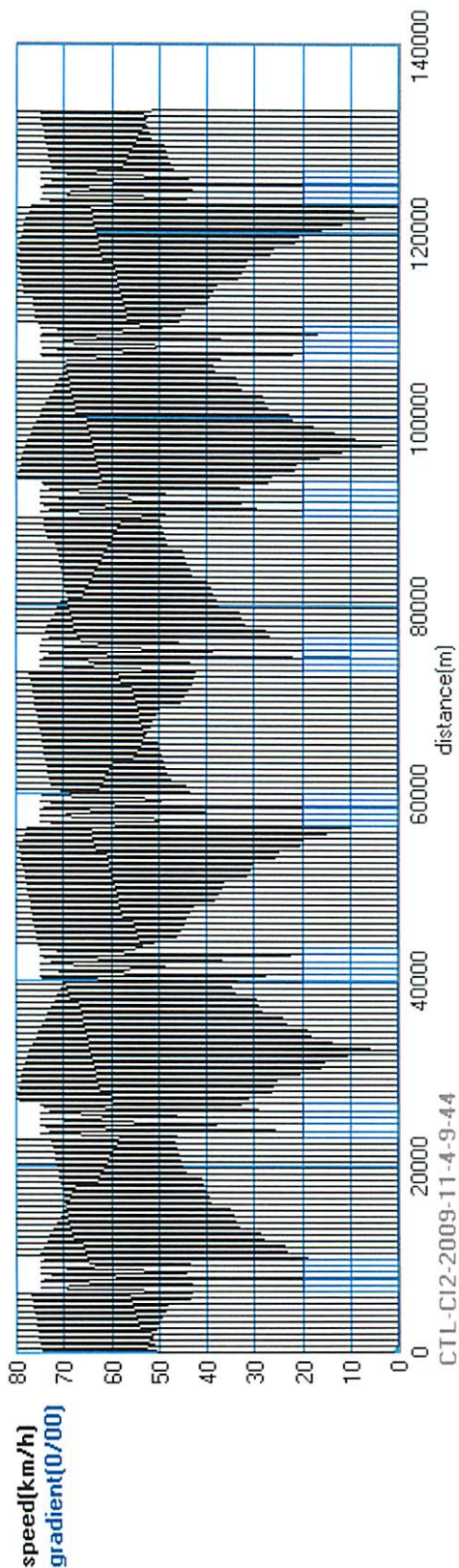


00012088

SERVICIO AFLUENCIA

	Dist(m)	Application
1	0	1:MEXICO DRIVE A2
2	6500	2:MEXICO DRIVE B2
3	10125	1:MEXICO DRIVE A2
4	16625	1:MEXICO DRIVE A2
5	23125	2:MEXICO DRIVE B2
6	26750	1:MEXICO DRIVE A2
7	33250	1:MEXICO DRIVE A2
8	39750	2:MEXICO DRIVE B2
9	43375	1:MEXICO DRIVE A2
10	49875	1:MEXICO DRIVE A2
11	56375	2:MEXICO DRIVE B2
12	60000	1:MEXICO DRIVE A2
13	66500	1:MEXICO DRIVE A2
14	73000	2:MEXICO DRIVE B2
15	76625	1:MEXICO DRIVE A2
16	83125	1:MEXICO DRIVE A2
17	89625	2:MEXICO DRIVE B2
18	93250	1:MEXICO DRIVE A2
19	99750	1:MEXICO DRIVE A2
20	106250	2:MEXICO DRIVE B2
21	109875	1:MEXICO DRIVE A2
22	116375	1:MEXICO DRIVE A2
23	122875	2:MEXICO DRIVE B2
24	126500	1:MEXICO DRIVE A2
25	133000	

3682

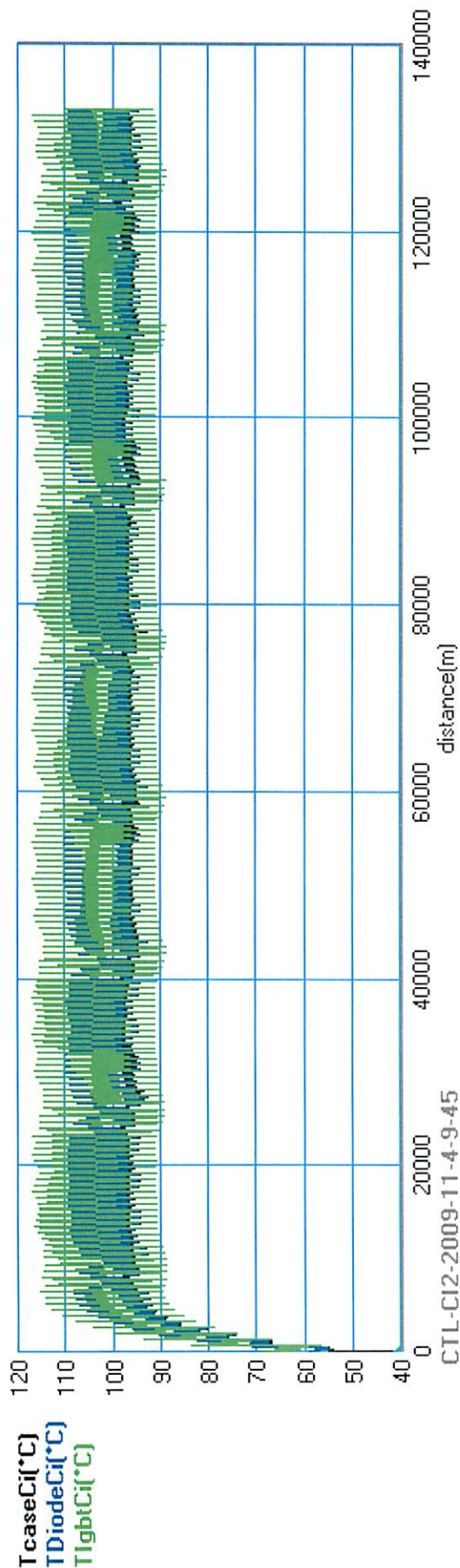


Trotor(°C)	Tiron_s(°C)	Tw_s(°C)
357.5	212.7	316.9

Handwritten signature in blue ink.

Handwritten red mark.

Handwritten red mark.



TcaseCi(°C)	TDiodeCi(°C)	TIgbtCi(°C)
101.63	111.60	116.89



302500

00012991

SERVICIO CONTINUO + SERVICIO AFLUENCIA

	Dist(m)	Application
1	0	1:MEXICO DRIVE A1
2	6800	2:MEXICO DRIVE B1
3	10150	1:MEXICO DRIVE A1
4	23750	2:MEXICO DRIVE B1
5	27100	1:MEXICO DRIVE A1
6	40700	2:MEXICO DRIVE B1
7	44050	1:MEXICO DRIVE A1
8	57650	2:MEXICO DRIVE B1
9	61000	1:MEXICO DRIVE A1
10	74600	2:MEXICO DRIVE B1
11	77950	1:MEXICO DRIVE A1
12	91550	2:MEXICO DRIVE B1
13	94900	1:MEXICO DRIVE A1
14	108500	2:MEXICO DRIVE B1
15	111850	1:MEXICO DRIVE A1
16	125450	2:MEXICO DRIVE B1
17	128800	1:MEXICO DRIVE A1
18	142400	2:MEXICO DRIVE B1
19	145750	1:MEXICO DRIVE A1
20	159350	2:MEXICO DRIVE B1
21	162700	1:MEXICO DRIVE A1
22	169500	3:MEXICO DRIVE A2
23	176000	4:MEXICO DRIVE B2
24	179625	3:MEXICO DRIVE A2
25	192625	4:MEXICO DRIVE B2
26	196250	3:MEXICO DRIVE A2
27	209250	4:MEXICO DRIVE B2
28	212875	3:MEXICO DRIVE A2
29	225875	4:MEXICO DRIVE B2
30	229500	3:MEXICO DRIVE A2
31	242500	4:MEXICO DRIVE B2
32	246125	3:MEXICO DRIVE A2
33	259125	4:MEXICO DRIVE B2
34	262750	3:MEXICO DRIVE A2
35	275750	4:MEXICO DRIVE B2
36	279375	3:MEXICO DRIVE A2
37	292375	4:MEXICO DRIVE B2
38	296000	3:MEXICO DRIVE A2
39	302500	

Cithel limitation 40 lines

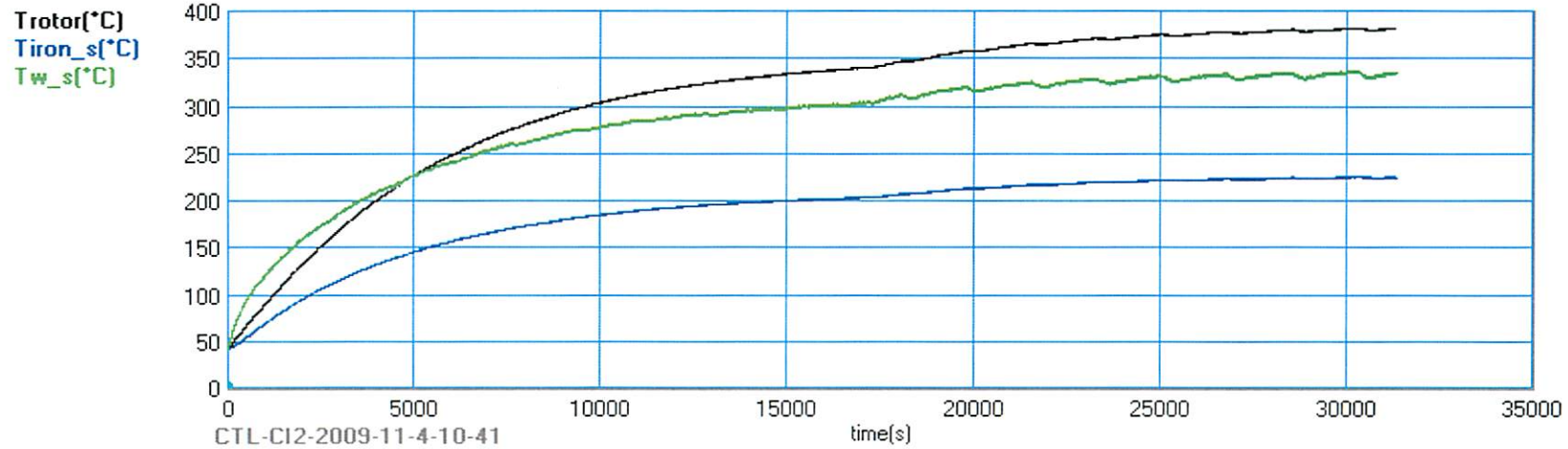
0 1:Electric
171500 2:Electric
311100

TcaseCi(°C)	TDiodeCi(°C)	TIgbtCi(°C)	Trotor(°C)	Tiron_s(°C)	Tw_s(°C)
102.2	114.2	117.3	384.4	226.4	337.8

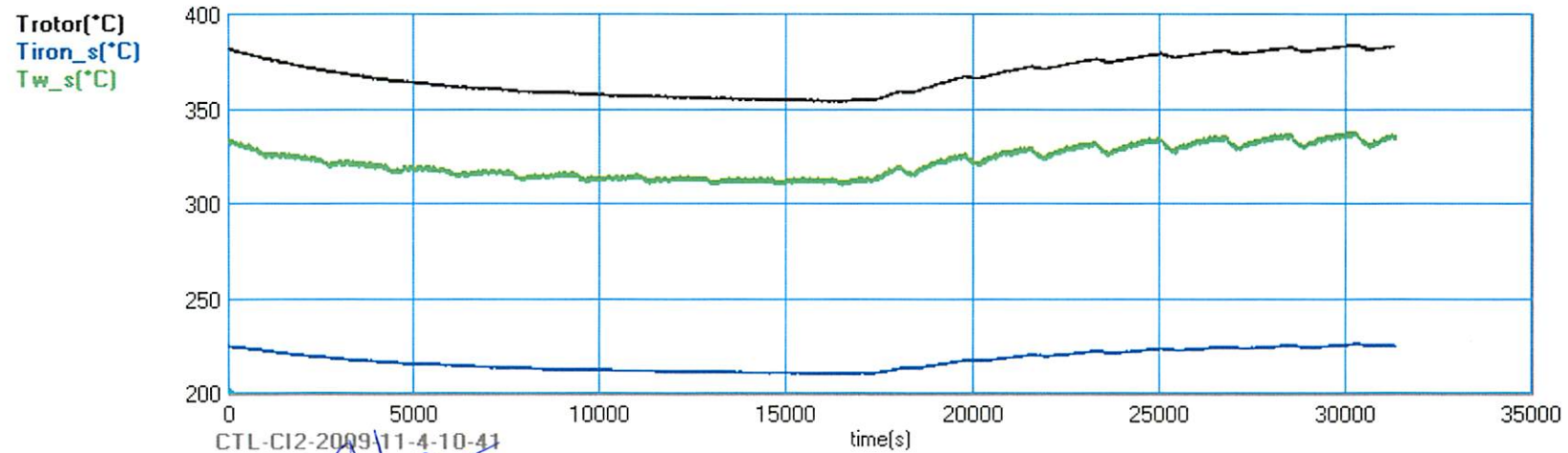
SERVICIO CONTINUO + SERVICIO AFLUENCIA + SERVICIO CONTINUO + SERVICIO AFLUENCIA + SERVICIO CONTINUO

Total time 22hours

full plot



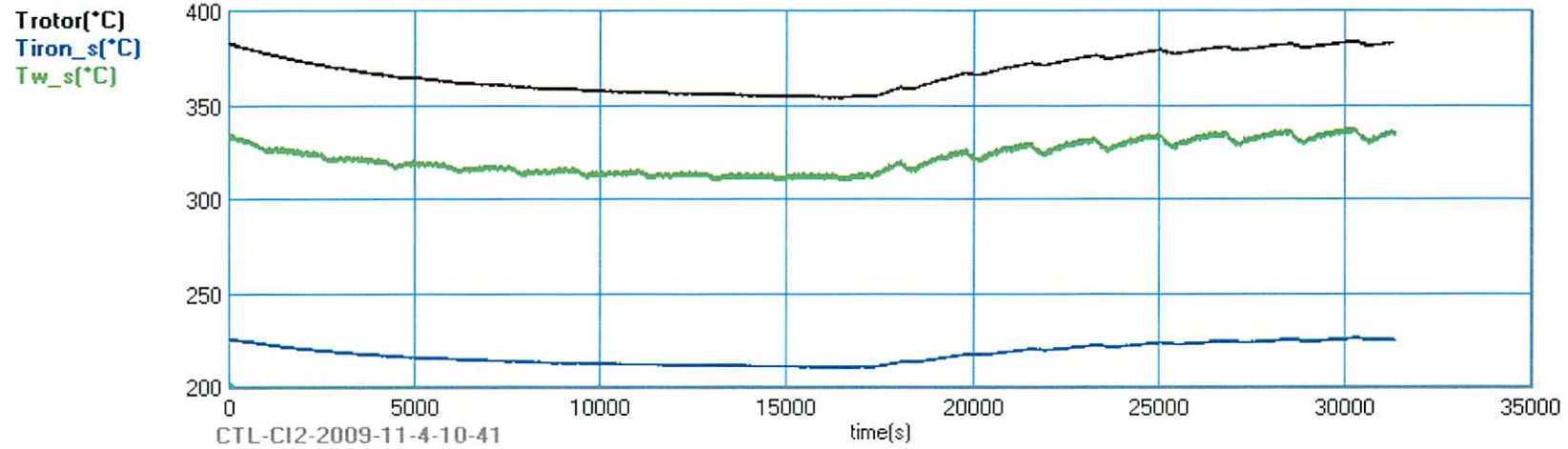
full plot



5555

00012002

half plot



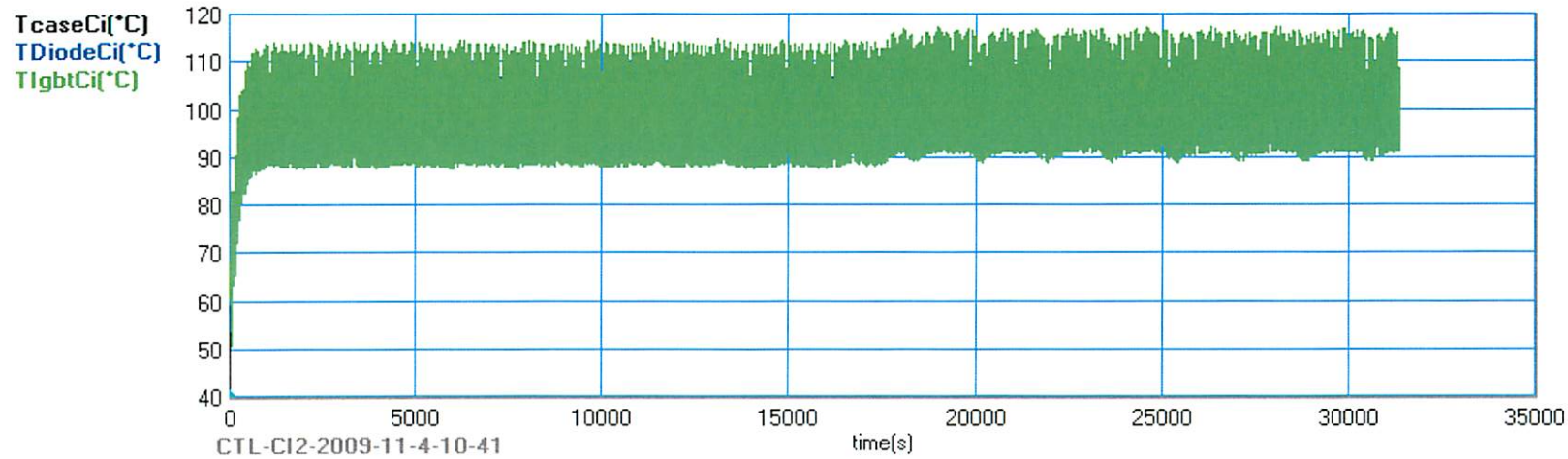
3687

0

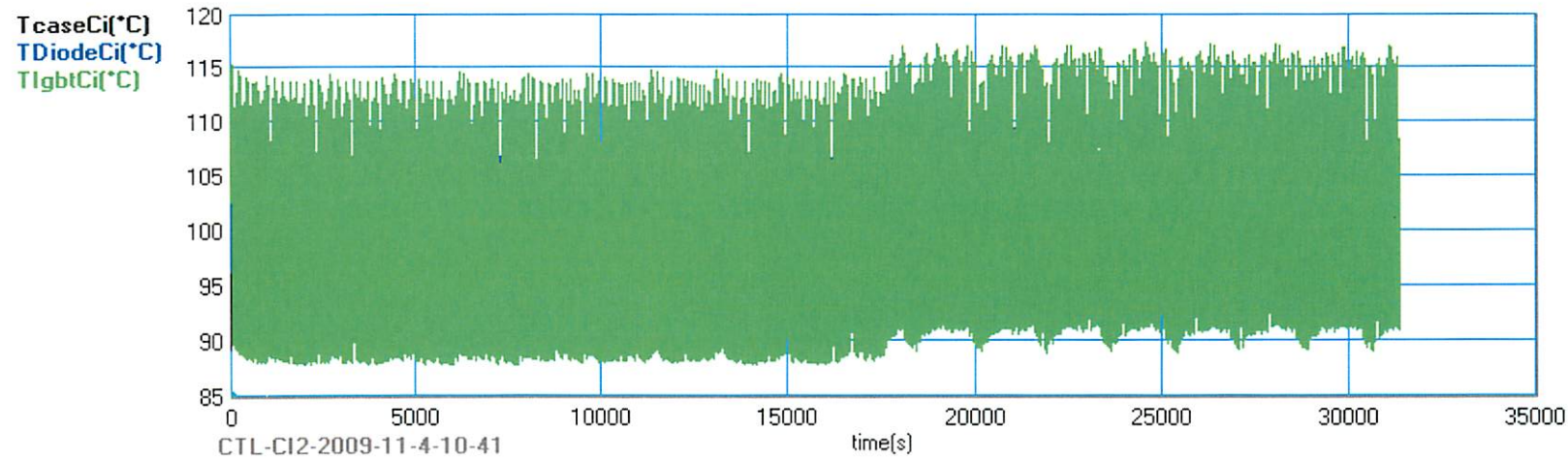
dy

00012003

full plot



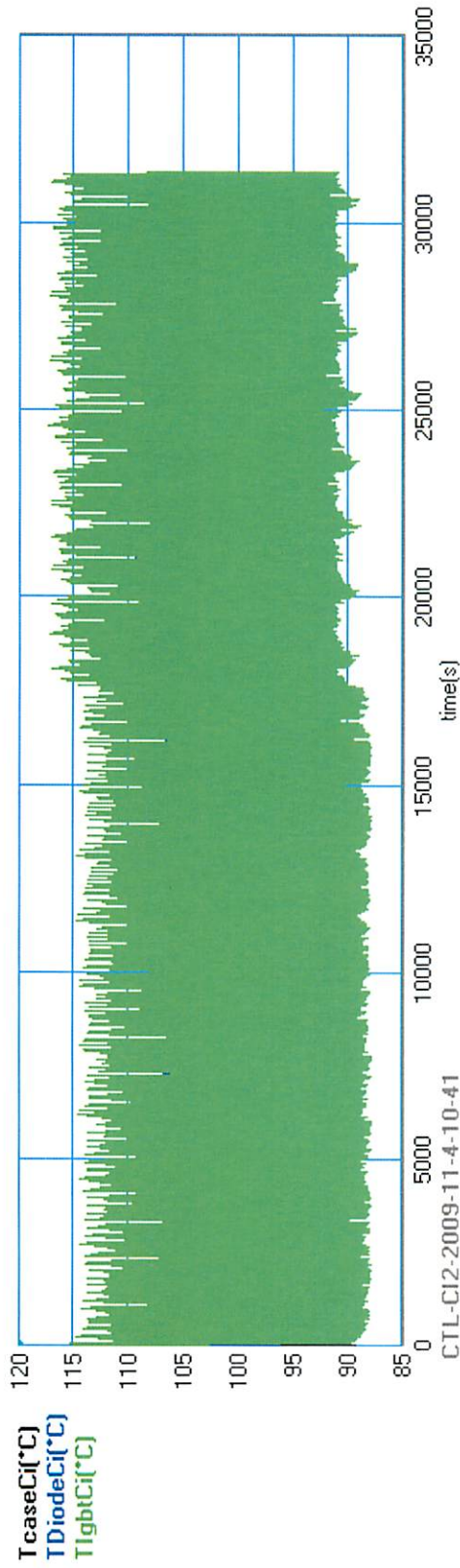
full plot



5689

00012004

full plot



3680

Handwritten signature in blue ink.

Handwritten signature in red ink.

00012005