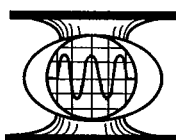


APPENDIX II-15-1

Analysis of Quench M1 Coil

For MICE Spectrometer Solenoid Magnets



Wang NMR, Inc.

550 North Canyons Parkway , Livermore, Ca. 94551

NAME UNIT	RC	TEMP	IC	VC	TIME DEPENDENCE OF IMPORTANT PARAMETERS																			
	mCHM	K	AMP	VOLT																				
60.0	200.0	300.0	3000.0	-																				
54.0	180.0	270.0	2700.0	-																				
48.0	160.0	240.0	2400.0	-																				
42.0	140.0	210.0	2100.0	-	A																			
36.0	120.0	180.0	1800.0	-		A																		
30.0	100.0	150.0	1500.0	-			A																	
24.0	80.0	120.0	1200.0	-				A																
18.0	60.0	90.0	900.0	-					A															
12.0	40.0	60.0	600.0	-						A														
6.0	20.0	30.0	300.0	-							A													
-0.0	0.0	0.0	0.0	-								A												
SYMB	R	T	A	V																				

QATCH1, QUENCH SIMULATION FOR MICE MATCH1 MAGNET, JULY 07, 2006
(FILD=DRHOC*AMP effective)

COMPONENT PROPERTIES

COMPONENT : 99.999 COPPER DRHOC : 4.55E-12

FRAC	THETA	A	AEX	B	BEX	C	CEX	D	DEX
0.8000	0.00	12.0000E-09	0.0000	11.8000E-14	3.2500	71.0000E-07	3.0290	0.0000E+00	0.0000
0.8000	40.00	14.1000E-13	2.7100	0.0000E+00	0.0000	83.4000E-05	1.7400	0.0000E+00	0.0000
0.8000	80.00	46.7000E-11	1.4500	0.0000E+00	0.0000	26.3600E-02	0.4235	0.0000E+00	0.0000

CRIT. TEMP. AT 0 FIELD : 9.0 DEG. KELVIN [THMAX]
MAX. FIELD AT TEMP THET : 111.8 K GAUSS [BMAX]
PEAK FIELD ON CONDUCTOR : 44.30 KGAUSS [FIED]
UNIT CELL AREA (WITH AMPS AMPO) : 0.0178 cm^2 [AR]
INITIAL TEMP THET : 4.20 DEG. KELVIN [THET]

INITIAL CURRENT = 214.20 [AMPO]
INITIAL PROT.R. = 0.0100 [RPR]
GAMMA = 0.00 [GAM]
R. SWITCH = 1000000.00 [RSW]
COIL INDUCTANCE = 15.7160 [HEN]
COIL INIT RESIS = 0.0000 [RO]

INITIAL VELOCITY = 2436.80 [VO]
UNIT CELL AREA = 0.017842 [AR]
INITIAL TEMPERATURE = 4.2000 [THET]
ALPHA = 0.00020 [AL1]
INITIAL X. VELOCITY = 34.4615 [VOX]
EPSILON = 0.00020 [EPS1]
INITIAL Y. VELOCITY = 34.4615 [VOY]
X COIL DIMENSION = 4.47 [XLIM]
Y COIL DIMENSION = 162.11 [YLIM]
Z COIL DIMENSION = 20.12 [ZLIM]
COORD. OF SOURCE X = 2.23 [XO]
COORD. OF SOURCE Y = 81.05 [YO]
COORD. OF SOURCE Z = 10.06 [ZO]

BREAKER DELAY TIME = 0.00 [DTIM]
CONDUCTOR LENGTH = 816981.63 [CONDL]
COIL VOLUME = 14576.59 [VOLTRU]

XM : 0.00 0.00 0.00 0.00 4.47 4.47 4.47 4.47
YM : 0.00 0.00 162.11 162.11 0.00 0.00 162.11 162.11
ZM : 0.00 20.12 0.00 20.12 0.00 20.12 0.00 20.12

TIME	CURRENT	I/IO	COIL OHMS	DEL VOLUME	EXT.VOLT	DEL.INT.ENG	INT.VOLT	MAXTEMP	NORMFRAC	VINDUC	VUNBAL	POWER	VELOC
TIM	AMP	AMPF	RT	VOL(I)	VOLT	ER	VINT	THETA(1)	VFRAC	VINDUC	VUNBAL	POWR	V
0.20	210.7	0.9837	0.1268E+01	0.1746E+04	2.1	0.1163E+05	271.6	77.4	0.1198	32.8	238.8	0.582E+05	1277. 1
0.40	203.1	0.9482	0.2828E+01	0.6054E+03	2.1	0.2511E+05	595.8	83.5	0.1613	96.5	499.3	0.126E+06	1257. 2
0.60	191.5	0.8941	0.4470E+01	0.3289E+03	2.0	0.3687E+05	907.8	90.5	0.1839	167.3	740.5	0.184E+06	1211. 5
0.80	177.1	0.8270	0.5885E+01	0.2996E+03	1.9	0.4317E+05	1127.1	97.3	0.2045	230.8	896.3	0.216E+06	1142. 5
1.00	162.6	0.7590	0.6454E+01	0.2738E+03	1.8	0.4051E+05	1143.3	103.5	0.2232	255.6	887.7	0.203E+06	1057. 5
1.20	148.1	0.6915	0.6975E+01	0.2499E+03	1.6	0.3687E+05	1134.0	109.0	0.2404	273.0	861.0	0.184E+06	970. 5
1.40	134.1	0.6260	0.7440E+01	0.2269E+03	1.5	0.3265E+05	1102.0	113.9	0.2559	282.4	819.6	0.163E+06	883. 5
1.60	120.7	0.5634	0.7845E+01	0.2050E+03	1.3	0.2821E+05	1051.8	118.0	0.2700	284.4	767.5	0.141E+06	800. 5
1.80	108.1	0.5046	0.8190E+01	0.1843E+03	1.2	0.2386E+05	988.4	121.4	0.2827	279.7	708.7	0.119E+06	720. 5
2.00	96.4	0.4501	0.8480E+01	0.1649E+03	1.1	0.1981E+05	916.5	124.2	0.2940	269.7	646.8	0.991E+05	645. 5
2.20	85.7	0.4001	0.8718E+01	0.1470E+03	1.0	0.1621E+05	840.5	126.5	0.3040	255.8	584.6	0.810E+05	575. 5
2.40	76.0	0.3547	0.8912E+01	0.1306E+03	0.9	0.1309E+05	763.7	128.4	0.3130	239.3	524.4	0.655E+05	511. 5
2.60	67.2	0.3137	0.9067E+01	0.1157E+03	0.8	0.1047E+05	688.9	129.9	0.3209	221.3	467.5	0.523E+05	453. 5
2.80	59.3	0.2770	0.9192E+01	0.1023E+03	0.7	0.8300E+04	617.6	131.0	0.3280	202.8	414.9	0.415E+05	401. 5
3.00	52.3	0.2442	0.9291E+01	0.9031E+02	0.6	0.6540E+04	551.2	131.9	0.3342	184.4	366.8	0.327E+05	354. 5
3.20	46.1	0.2150	0.9369E+01	0.7961E+02	0.5	0.5126E+04	490.0	132.7	0.3396	166.6	323.4	0.256E+05	312. 5
3.40	40.5	0.1892	0.9430E+01	0.7010E+02	0.5	0.4001E+04	434.4	133.2	0.3444	149.8	284.6	0.200E+05	275. 5
3.60	35.6	0.1664	0.9478E+01	0.6167E+02	0.4	0.3114E+04	384.1	133.7	0.3487	134.1	250.1	0.156E+05	242. 5
3.80	31.3	0.1462	0.9516E+01	0.5422E+02	0.4	0.2417E+04	339.1	134.0	0.3524	119.6	219.5	0.121E+05	213. 5
4.00	27.5	0.1284	0.9545E+01	0.4764E+02	0.3	0.1872E+04	298.9	134.3	0.3556	106.4	192.5	0.936E+04	187. 5
4.20	24.2	0.1128	0.9568E+01	0.4184E+02	0.3	0.1448E+04	263.2	134.5	0.3585	94.5	168.7	0.724E+04	164. 5
4.40	21.2	0.0990	0.9587E+01	0.3674E+02	0.2	0.1119E+04	231.6	134.6	0.3610	83.7	147.9	0.559E+04	144. 5
4.60	18.6	0.0869	0.9601E+01	0.3225E+02	0.2	0.8633E+03	203.6	134.7	0.3633	74.0	129.5	0.432E+04	126. 5
4.80	16.3	0.0762	0.9612E+01	0.2831E+02	0.2	0.6658E+03	178.9	134.8	0.3652	65.4	113.5	0.333E+04	111. 5
5.00	14.3	0.0669	0.9621E+01	0.2484E+02	0.2	0.5132E+03	157.1	134.9	0.3669	57.7	99.4	0.257E+04	97. 5
5.20	12.6	0.0587	0.9627E+01	0.2179E+02	0.1	0.3954E+03	138.0	135.0	0.3684	50.9	87.1	0.198E+04	85. 5
5.40	11.0	0.0515	0.9633E+01	0.1912E+02	0.1	0.3045E+03	121.1	135.0	0.3697	44.8	76.3	0.152E+04	75. 5
5.60	9.7	0.0452	0.9637E+01	0.1677E+02	0.1	0.2345E+03	106.3	135.0	0.3709	39.5	66.8	0.117E+04	66. 5
5.80	8.5	0.0396	0.9640E+01	0.1471E+02	0.1	0.1805E+03	93.3	135.1	0.3719	34.7	58.6	0.903E+03	58. 5
6.00	7.4	0.0348	0.9643E+01	0.1291E+02	0.1	0.1389E+03	81.8	135.1	0.3728	30.5	51.3	0.695E+03	51. 5
6.20	6.5	0.0305	0.9645E+01	0.1132E+02	0.1	0.1069E+03	71.8	135.1	0.3735	26.8	45.0	0.535E+03	44. 5
6.40	5.7	0.0267	0.9647E+01	0.9930E+01	0.1	0.8227E+02	63.0	135.1	0.3742	23.6	39.4	0.411E+03	39. 5
6.60	5.0	0.0235	0.9648E+01	0.8710E+01	0.1	0.6330E+02	55.3	135.1	0.3748	20.7	34.5	0.317E+03	34. 5
6.80	4.4	0.0206	0.9649E+01	0.7639E+01	0.1	0.4871E+02	48.5	135.1	0.3753	18.2	30.3	0.244E+03	30. 5
7.00	3.9	0.0180	0.9650E+01	0.6700E+01	0.0	0.3747E+02	42.5	135.1	0.3758	16.0	26.5	0.187E+03	26. 5
7.20	3.4	0.0158	0.9651E+01	0.5876E+01	0.0	0.2883E+02	37.3	135.1	0.3762	14.0	23.3	0.144E+03	23. 5
7.40	3.0	0.0139	0.9651E+01	0.5154E+01	0.0	0.2218E+02	32.7	135.1	0.3765	12.3	20.4	0.111E+03	20. 5
7.60	2.6	0.0122	0.9652E+01	0.4520E+01	0.0	0.1706E+02	28.7	135.1	0.3769	10.8	17.9	0.853E+02	18. 5
7.80	2.3	0.0107	0.9652E+01	0.3964E+01	0.0	0.1312E+02	25.2	135.1	0.3771	9.5	15.7	0.656E+02	16. 5

TOTAL INTERNAL ENERGY = 0.3761E+06 TOTAL SWITCH ENERGY = 0.6693E-05 TOTAL EXT. ENERGY = 0.6693E+03
 FRACTION OF ENERGY DUMPED IN HE = 0.998224 INTEGRAL CURRENT SQUARED DT = 0.6693E+05
 MAX TEMPERATURE RISE = 135.13 MAX INTERNAL VOLTAGE = 1143.29 TIME CONSTANT = 2.400000
 ONLY 37.7 % OF COIL VOLUME GOES NORMAL.

"QATCH1, QUENCH SIMULATION FOR MICE MATCH1 MAGNET, JULY 07, 2006"
60.,200,300,3000,10
1,5
.80,0.455E-11,"99.999 COPPER"
3
0.0,0.12E-7,0,0.118E-12,3.25,0.71E-5,3.029,0,0
40,0.141E-11,2.71,0,0,0.834E-3,1.74,0,0
80,0.467E-9,1.45,0,0,0.2636,0.4235,0,0
0
9.,111.8
44.3,.017842,4.2
.20,900,0
0.0002,0.0002,4.4699,162.106,20.1168,2.23495,81.053,10.0584
214.2,0.010,0,1000000,15.716,0

APPENDIX II-15-2

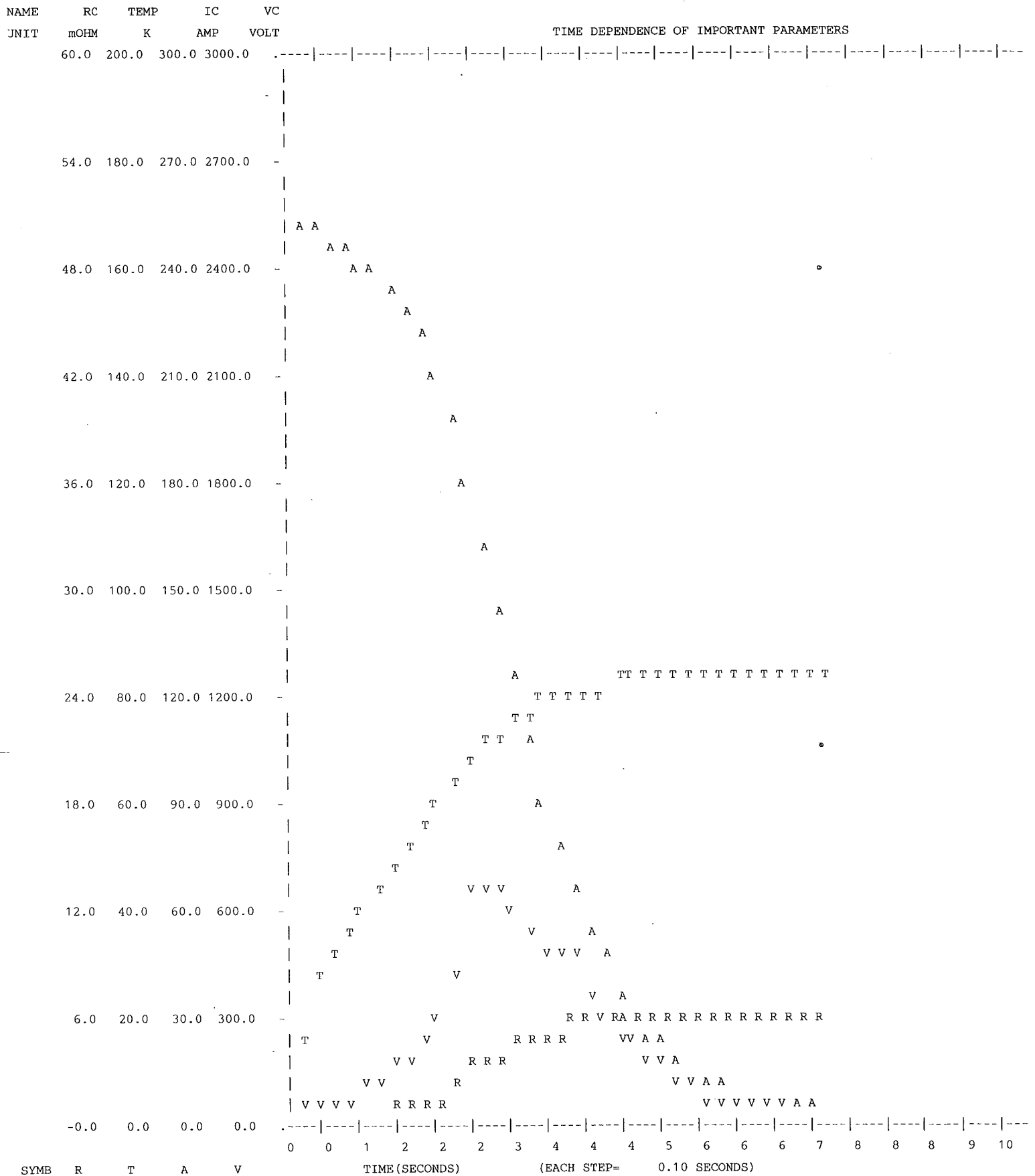
Analysis of Quench M2 Coil

For MICE Spectrometer Solenoid Magnets



Wang NMR, Inc.

550 North Canyons Parkway , Livermore, Ca. 94551



QMATCH2, QUENCH SIMULATION FOR MICE MATCH2 MAGNET, JULY 07, 2006
(FILD=DRHOC*AMP effective)

COMPONENT PROPERTIES

COMPONENT : 99.999 COPPER DRHOC : 4.55E-12

FRAC	THETA	A	AEX	B	BEX	C	CEX	D	DEX
0.8000	0.00	12.0000E-09	0.0000	11.8000E-14	3.2500	71.0000E-07	3.0290	0.0000E+00	0.0000
0.8000	40.00	14.1000E-13	2.7100	0.0000E+00	0.0000	83.4000E-05	1.7400	0.0000E+00	0.0000
0.8000	80.00	46.7000E-11	1.4500	0.0000E+00	0.0000	26.3600E-02	0.4235	0.0000E+00	0.0000

CRIT. TEMP. AT 0 FIELD : 9.0 DEG. KELVIN [THMAX]
MAX. FIELD AT TEMP THET : 111.8 K GAUSS [BMAX]
PEAK FIELD ON CONDUCTOR : 40.10 KGAUSS [FIED]
UNIT CELL AREA (WITH AMPS AMPO) : 0.0178 cm^2 [AR]
INITIAL TEMP THET : 4.20 DEG. KELVIN [THET]

INITIAL CURRENT = 251.80 [AMPO]
INITIAL PROT.R. = 0.0100 [RPR]
GAMMA = 0.00 [GAM]
R. SWITCH = 1000000.00 [RSW]
COIL INDUCTANCE = 6.8514 [HEN]
COIL INIT RESIS = 0.0000 [RO]

INITIAL VELOCITY = 2670.28 [VO]
UNIT CELL AREA = 0.017842 [AR]
INITIAL TEMPERATURE = 4.2000 [THET]
ALPHA = 0.00020 [AL1]
INITIAL X. VELOCITY = 37.7635 [VOX]
EPSILON = 0.00020 [EPS1]
INITIAL Y. VELOCITY = 37.7635 [VOY]
X COIL DIMENSION = 2.98 [XLIM]
Y COIL DIMENSION = 162.11 [YLIM]
Z COIL DIMENSION = 19.95 [ZLIM]
COORD. OF SOURCE X = 1.49 [XO]
COORD. OF SOURCE Y = 81.05 [YO]
COORD. OF SOURCE Z = 9.97 [ZO]

BREAKER DELAY TIME = 0.00 [DTIM]
CONDUCTOR LENGTH = 540110.56 [CONDL]
COIL VOLUME = 9636.65 [VOLTRU]

XM : 0.00 0.00 0.00 0.00 2.98 2.98 2.98 2.98
YM : 0.00 0.00 162.11 162.11 0.00 0.00 162.11 162.11
ZM : 0.00 19.95 0.00 19.95 0.00 19.95 0.00 19.95

TIME	CURRENT	I/IO	COIL OHMS	DEL VOLUME	EXT.VOLT	DEL.INT.ENG	INT.VOLT	MAXTEMP	NORMFRAC	VINDUC	VUNBAL	POWER	VELOC
TIM	AMP	AMPF	RT	VOL(I)	VOLT	ER	VINT	THETA(1)	VFRAC	VINDUC	VUNBAL	POWER	V
0.20	250.6	0.9952	0.1479E+00	0.2836E+04	2.5	0.1875E+04	37.2	17.5	0.2943	11.7	25.5	0.938E+04	1502. 1
0.40	249.1	0.9891	0.2016E+00	0.2676E+03	2.5	0.2533E+04	50.5	26.3	0.3221	17.1	33.4	0.127E+05	1495. 5
0.60	247.0	0.9811	0.2677E+00	0.2543E+03	2.5	0.3321E+04	66.7	32.1	0.3485	24.1	42.6	0.166E+05	1485. 5
0.80	244.5	0.9710	0.3425E+00	0.2500E+03	2.5	0.4180E+04	84.6	36.5	0.3744	32.6	52.0	0.209E+05	1473. 5
1.00	241.4	0.9586	0.4278E+00	0.2465E+03	2.4	0.5114E+04	104.6	40.2	0.4000	42.8	61.8	0.256E+05	1458. 5
1.20	237.4	0.9429	0.5505E+00	0.2429E+03	2.4	0.6415E+04	132.9	43.9	0.4252	57.5	75.4	0.321E+05	1440. 5
1.40	232.5	0.9233	0.7006E+00	0.2387E+03	2.4	0.7898E+04	166.3	47.7	0.4500	75.9	90.4	0.395E+05	1416. 5
1.60	226.4	0.8993	0.8819E+00	0.2336E+03	2.3	0.9534E+04	205.0	51.7	0.4742	98.3	106.7	0.477E+05	1387. 5
1.80	219.1	0.8701	0.1100E+01	0.2274E+03	2.3	0.1128E+05	249.1	55.8	0.4978	125.2	124.0	0.564E+05	1351. 5
2.00	210.1	0.8346	0.1391E+01	0.2200E+03	2.2	0.1335E+05	304.7	59.9	0.5206	159.8	144.9	0.668E+05	1307. 5
2.20	198.0	0.7862	0.1975E+01	0.2110E+03	2.1	0.1744E+05	415.0	63.9	0.5425	226.3	188.7	0.872E+05	1253. 5
2.40	179.3	0.7120	0.3222E+01	0.1987E+03	2.0	0.2525E+05	637.8	67.7	0.5631	360.3	277.5	0.126E+06	1181. 5
2.60	160.3	0.6366	0.3619E+01	0.1799E+03	1.8	0.2327E+05	648.9	70.9	0.5818	378.6	270.3	0.116E+06	1069. 5
2.80	141.7	0.5626	0.3972E+01	0.1609E+03	1.6	0.2041E+05	636.7	73.6	0.5985	382.0	254.7	0.102E+06	956. 5
3.00	124.0	0.4923	0.4272E+01	0.1422E+03	1.4	0.1715E+05	605.2	75.8	0.6133	372.0	233.2	0.857E+05	845. 5
3.20	107.6	0.4272	0.4518E+01	0.1244E+03	1.2	0.1388E+05	560.0	77.5	0.6262	351.4	208.6	0.694E+05	739. 5
3.40	92.7	0.3683	0.4713E+01	0.1079E+03	1.1	0.1091E+05	507.0	78.8	0.6374	323.8	183.2	0.545E+05	642. 5
3.60	79.5	0.3159	0.4864E+01	0.9305E+02	0.9	0.8367E+04	451.1	79.8	0.6470	292.5	158.6	0.418E+05	553. 5
3.80	66.3	0.2632	0.5706E+01	0.7981E+02	0.8	0.7221E+04	453.9	80.7	0.6553	298.0	155.9	0.361E+05	474. 5
4.00	55.1	0.2187	0.5785E+01	0.6649E+02	0.7	0.5082E+04	383.4	81.4	0.6622	254.3	129.1	0.254E+05	395. 5
4.20	45.7	0.1813	0.5841E+01	0.5524E+02	0.6	0.3542E+04	321.6	81.9	0.6679	215.2	106.4	0.177E+05	328. 5
4.40	37.8	0.1502	0.5881E+01	0.4581E+02	0.5	0.2452E+04	268.5	82.2	0.6727	180.9	87.6	0.123E+05	272. 5
4.60	31.3	0.1242	0.5908E+01	0.3793E+02	0.4	0.1689E+04	223.4	82.5	0.6766	151.4	72.0	0.844E+04	225. 5
4.80	25.9	0.1027	0.5927E+01	0.3138E+02	0.3	0.1160E+04	185.4	82.6	0.6799	126.2	59.1	0.580E+04	187. 5
5.00	21.4	0.0848	0.5940E+01	0.2594E+02	0.3	0.7943E+03	153.6	82.7	0.6826	105.0	48.6	0.397E+04	154. 5
5.20	17.6	0.0701	0.5950E+01	0.2143E+02	0.2	0.5432E+03	127.1	82.8	0.6848	87.2	39.9	0.272E+04	127. 5
5.40	14.6	0.0579	0.5956E+01	0.1771E+02	0.2	0.3710E+03	105.1	82.8	0.6866	72.3	32.8	0.186E+04	105. 5
5.60	12.0	0.0478	0.5961E+01	0.1462E+02	0.1	0.2532E+03	86.9	82.9	0.6882	59.9	27.0	0.127E+04	87. 5
5.80	9.9	0.0395	0.5964E+01	0.1207E+02	0.1	0.1727E+03	71.8	82.9	0.6894	49.6	22.2	0.864E+03	72. 5
6.00	8.2	0.0326	0.5966E+01	0.9968E+01	0.1	0.1178E+03	59.3	82.9	0.6904	41.0	18.3	0.589E+03	59. 5
6.20	6.8	0.0269	0.5968E+01	0.8229E+01	0.1	0.8030E+02	49.0	82.9	0.6913	33.9	15.1	0.402E+03	49. 5
6.40	5.6	0.0222	0.5969E+01	0.6793E+01	0.1	0.5473E+02	40.4	82.9	0.6920	28.0	12.4	0.274E+03	40. 5
6.60	4.6	0.0183	0.5970E+01	0.5607E+01	0.1	0.3730E+02	33.4	82.9	0.6926	23.1	10.2	0.187E+03	33. 5
6.80	3.8	0.0151	0.5970E+01	0.4628E+01	0.0	0.2542E+02	27.5	82.9	0.6931	19.1	8.4	0.127E+03	28. 5
7.00	3.1	0.0125	0.5971E+01	0.3820E+01	0.0	0.1732E+02	22.7	82.9	0.6935	15.8	6.9	0.866E+02	23. 5
7.20	2.6	0.0103	0.5971E+01	0.3153E+01	0.0	0.1180E+02	18.8	82.9	0.6938	13.0	5.7	0.590E+02	19. 5

TOTAL INTERNAL ENERGY = 0.2258E+06 TOTAL SWITCH ENERGY = 0.1588E-04 TOTAL EXT. ENERGY = 0.1588E+04

FRACTION OF ENERGY DUMPED IN HE = 0.993016 INTEGRAL CURRENT SQUARED DT = 0.1588E+06

MAX TEMPERATURE RISE = 82.95 MAX INTERNAL VOLTAGE = 453.88 TIME CONSTANT = 3.600001

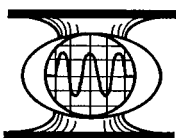
ONLY 69.4 % OF COIL VOLUME GOES NORMAL.

"QMATCH2, QUENCH SIMULATION FOR MICE MATCH2 MAGNET, JULY 07, 2006"
50.,200,300,3000,10
1,5
.80,0.455E-11,"99.999 COPPER"
3
).0,0.12E-7,0,0.118E-12,3.25,0.71E-5,3.029,0,0
40,0.141E-11,2.71,0,0,0.834E-3,1.74,0,0
80,0.467E-9,1.45,0,0,0.2636,0.4235,0,0
)
9.,111.8
40.1,.017842,4.2
.20,900,0
)0.0002,0.0002,2.9799,162.106,19.9492,1.48995,81.053,9.9746
251.8,0.010,0,1000000,6.8514,0

APPENDIX II-15-3

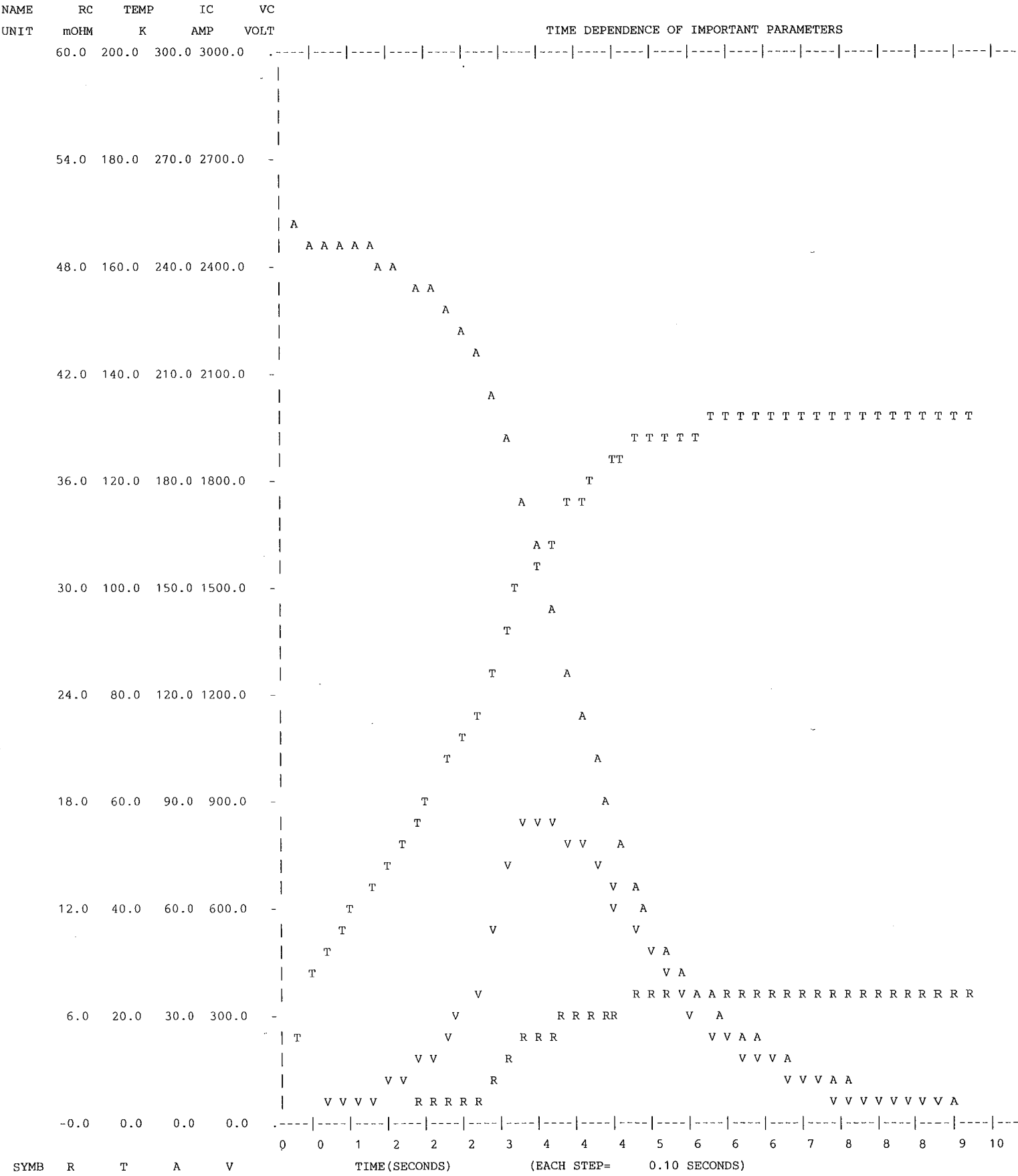
Analysis of Quench End1 Coil

For MICE Spectrometer Solenoid Magnets



Wang NMR, Inc.

550 North Canyons Parkway , Livermore, Ca. 94551



QMIEND1, QUENCH SIMULATION FOR MICE END1 MAGNET, JULY 07, 2006
(FILD=DRHOC*AMP effective)

COMPONENT PROPERTIES

COMPONENT : 99.999 COPPER DRHOC : 4.55E-12

FRAC	THETA	A	AEX	B	BEX	C	CEX	D	DEX
0.8000	0.00	12.0000E-09	0.0000	11.8000E-14	3.2500	71.0000E-07	3.0290	0.0000E+00	0.0000
0.8000	40.00	14.1000E-13	2.7100	0.0000E+00	0.0000	83.4000E-05	1.7400	0.0000E+00	0.0000
0.8000	80.00	46.7000E-11	1.4500	0.0000E+00	0.0000	26.3600E-02	0.4235	0.0000E+00	0.0000

CRIT. TEMP. AT 0 FIELD : 9.0 DEG. KELVIN [THMAX]
MAX. FIELD AT TEMP THET : 111.8 K GAUSS [BMAX]
PEAK FIELD ON CONDUCTOR : 59.00 KGAUSS [FIED]
UNIT CELL AREA (WITH AMPS AMPO) : 0.0178 cm^2 [AR]
INITIAL TEMP THET : 4.20 DEG. KELVIN [THET]

INITIAL CURRENT = 249.50 [AMPO]
INITIAL PROT.R. = 0.0100 [RPR]
GAMMA = 0.00 [GAM]
R. SWITCH = 1000000.00 [RSW]
COIL INDUCTANCE = 10.5220 [HEN]
COIL INIT RESIS = 0.0000 [RO]

INITIAL VELOCITY = 3711.43 [VO]
UNIT CELL AREA = 0.017842 [AR]
INITIAL TEMPERATURE = 4.2000 [THET]
ALPHA = 0.00010 [AL1]
INITIAL X. VELOCITY = 37.1143 [VOX]
EPSILON = 0.00010 [EPS1]
INITIAL Y. VELOCITY = 37.1143 [VOY]
X COIL DIMENSION = 5.96 [XLIM]
Y COIL DIMENSION = 162.11 [YLIM]
Z COIL DIMENSION = 11.06 [ZLIM]
COORD. OF SOURCE X = 2.98 [XO]
COORD. OF SOURCE Y = 81.05 [YO]
COORD. OF SOURCE Z = 5.53 [ZO]

BREAKER DELAY TIME = 0.00 [DTIM]
CONDUCTOR LENGTH = 599121.00 [CONDL]
COIL VOLUME = 10689.52 [VOLTRU]

XM : -0.00 -0.00 -0.00 -0.00 5.96 5.96 5.96 5.96
YM : 0.00 0.00 162.11 162.11 0.00 0.00 162.11 162.11
ZM : 0.00 11.06 0.00 11.06 0.00 11.06 0.00 11.06

TIME	CURRENT	I/IO	COIL OHMS	DEL VOLUME	EXT.VOLT	DEL.INT.ENG	INT.VOLT	MAXTEMP	NORMFRAC	VINDUC	VUNBAL	POWER	VELOC
TIM	AMP	AMPF	RT	VOL(I)	VOLT	ER	VINT	THETA(1)	VFRAC	VINDUC	VUNBAL	POWR	V
0.20	249.1	0.9984	0.7178E-01	0.1380E+04	2.5	0.8935E+03	17.9	17.3	0.1291	2.6	15.3	0.447E+04	1488. 1
0.40	248.6	0.9962	0.1027E+00	0.2304E+03	2.5	0.1274E+04	25.6	26.1	0.1506	4.2	21.3	0.637E+04	1486. 2
0.60	247.8	0.9932	0.1495E+00	0.3828E+03	2.5	0.1847E+04	37.2	31.9	0.1864	7.4	29.8	0.923E+04	1482. 2
0.80	246.8	0.9893	0.1959E+00	0.2127E+03	2.5	0.2406E+04	48.5	36.4	0.2063	10.5	38.0	0.120E+05	1478. 5
1.00	245.6	0.9844	0.2497E+00	0.2036E+03	2.5	0.3043E+04	61.6	40.2	0.2254	14.5	47.2	0.152E+05	1472. 5
1.20	244.0	0.9781	0.3253E+00	0.1992E+03	2.5	0.3924E+04	79.9	44.0	0.2440	20.1	59.8	0.196E+05	1465. 5
1.40	242.1	0.9702	0.4197E+00	0.1961E+03	2.4	0.4999E+04	102.4	48.1	0.2624	27.5	74.9	0.250E+05	1456. 5
1.60	239.5	0.9600	0.5387E+00	0.1934E+03	2.4	0.6312E+04	130.4	52.4	0.2805	37.2	93.1	0.316E+05	1444. 5
1.80	236.4	0.9473	0.6856E+00	0.1907E+03	2.4	0.7867E+04	164.2	57.1	0.2983	49.7	114.5	0.393E+05	1429. 5
2.00	232.4	0.9316	0.8652E+00	0.1878E+03	2.4	0.9668E+04	204.5	62.0	0.3159	65.3	139.2	0.483E+05	1410. 5
2.20	227.6	0.9122	0.1083E+01	0.1843E+03	2.3	0.1170E+05	251.6	67.1	0.3331	84.6	167.0	0.585E+05	1386. 5
2.40	221.8	0.8888	0.1343E+01	0.1802E+03	2.3	0.1391E+05	305.6	72.4	0.3500	107.7	197.9	0.696E+05	1357. 5
2.60	214.7	0.8606	0.1659E+01	0.1754E+03	2.2	0.1632E+05	367.9	77.8	0.3664	135.6	232.3	0.816E+05	1323. 5
2.80	204.7	0.8204	0.2447E+01	0.1697E+03	2.1	0.2256E+05	525.4	84.2	0.3823	201.7	323.8	0.113E+06	1281. 5
3.00	191.2	0.7664	0.3451E+01	0.1617E+03	2.0	0.2892E+05	706.4	91.4	0.3974	281.5	424.8	0.145E+06	1221. 5
3.20	175.4	0.7029	0.4351E+01	0.1510E+03	1.9	0.3182E+05	832.1	98.2	0.4115	343.2	488.9	0.159E+06	1140. 5
3.40	159.0	0.6374	0.4889E+01	0.1384E+03	1.8	0.3007E+05	857.5	104.4	0.4245	364.7	492.8	0.150E+06	1046. 5
3.60	143.0	0.5733	0.5282E+01	0.1255E+03	1.6	0.2672E+05	840.0	109.7	0.4362	367.1	472.9	0.134E+06	949. 5
3.80	127.7	0.5119	0.5622E+01	0.1129E+03	1.4	0.2301E+05	804.2	114.2	0.4468	359.9	444.3	0.115E+06	853. 5
4.00	113.2	0.4538	0.5964E+01	0.1008E+03	1.3	0.1946E+05	761.8	117.9	0.4562	348.1	413.7	0.973E+05	762. 5
4.20	99.9	0.4002	0.6201E+01	0.8930E+02	1.1	0.1590E+05	702.1	121.0	0.4645	326.7	375.4	0.795E+05	675. 5
4.40	87.7	0.3515	0.6393E+01	0.7875E+02	1.0	0.1275E+05	638.3	123.4	0.4719	301.7	336.6	0.637E+05	596. 5
4.60	76.8	0.3077	0.6545E+01	0.6916E+02	0.9	0.1007E+05	574.0	125.3	0.4784	275.0	299.0	0.503E+05	523. 5
4.80	67.0	0.2687	0.6664E+01	0.6054E+02	0.8	0.7857E+04	511.7	126.7	0.4840	248.0	263.6	0.393E+05	458. 5
5.00	58.4	0.2341	0.6757E+01	0.5285E+02	0.7	0.6073E+04	453.0	127.9	0.4890	221.8	231.2	0.304E+05	400. 5
5.20	50.8	0.2037	0.6829E+01	0.4605E+02	0.6	0.4660E+04	398.9	128.7	0.4933	197.1	201.8	0.233E+05	348. 5
5.40	44.2	0.1770	0.6884E+01	0.4006E+02	0.5	0.3556E+04	349.9	129.4	0.4970	174.1	175.7	0.178E+05	303. 5
5.60	38.3	0.1535	0.6979E+01	0.3481E+02	0.4	0.2722E+04	308.2	129.9	0.5003	154.4	153.8	0.136E+05	263. 5
5.80	33.2	0.1330	0.7011E+01	0.3019E+02	0.4	0.2056E+04	268.5	130.3	0.5031	135.3	133.2	0.103E+05	228. 5
6.00	28.7	0.1152	0.7035E+01	0.2616E+02	0.3	0.1549E+04	233.5	130.5	0.5056	118.2	115.3	0.775E+04	198. 5
6.20	24.9	0.0997	0.7053E+01	0.2265E+02	0.3	0.1165E+04	202.7	130.8	0.5077	103.1	99.7	0.583E+04	171. 5
6.40	21.5	0.0863	0.7067E+01	0.1961E+02	0.2	0.8752E+03	175.9	130.9	0.5095	89.7	86.1	0.438E+04	148. 5
6.60	18.6	0.0747	0.7078E+01	0.1697E+02	0.2	0.6565E+03	152.4	131.0	0.5111	78.0	74.4	0.328E+04	128. 5
6.80	16.1	0.0646	0.7086E+01	0.1469E+02	0.2	0.4921E+03	132.0	131.1	0.5125	67.8	64.3	0.246E+04	111. 5
7.00	13.9	0.0559	0.7092E+01	0.1271E+02	0.2	0.3686E+03	114.3	131.2	0.5137	58.8	55.5	0.184E+04	96. 5
7.20	12.1	0.0483	0.7097E+01	0.1099E+02	0.1	0.2760E+03	99.0	131.2	0.5147	51.0	48.0	0.138E+04	83. 5
7.40	10.4	0.0418	0.7100E+01	0.9505E+01	0.1	0.2066E+03	85.6	131.3	0.5156	44.2	41.4	0.103E+04	72. 5
7.60	9.0	0.0362	0.7103E+01	0.8220E+01	0.1	0.1546E+03	74.1	131.3	0.5164	38.3	35.8	0.773E+03	62. 5
7.80	7.8	0.0313	0.7105E+01	0.7109E+01	0.1	0.1156E+03	64.1	131.3	0.5170	33.2	30.9	0.578E+03	54. 5
8.00	6.7	0.0270	0.7107E+01	0.6147E+01	0.1	0.8648E+02	55.4	131.3	0.5176	28.7	26.7	0.432E+03	47. 5
8.20	5.8	0.0234	0.7108E+01	0.5316E+01	0.1	0.6468E+02	47.9	131.4	0.5181	24.9	23.1	0.323E+03	40. 5
8.40	5.0	0.0202	0.7109E+01	0.4597E+01	0.1	0.4837E+02	41.5	131.4	0.5185	21.5	19.9	0.242E+03	35. 5
8.60	4.4	0.0175	0.7110E+01	0.3975E+01	0.1	0.3617E+02	35.9	131.4	0.5189	18.6	17.2	0.181E+03	30. 5
8.80	3.8	0.0151	0.7110E+01	0.3437E+01	0.0	0.2704E+02	31.0	131.4	0.5192	16.1	14.9	0.135E+03	26. 5
9.00	3.3	0.0131	0.7111E+01	0.2971E+01	0.0	0.2022E+02	26.8	131.4	0.5195	13.9	12.9	0.101E+03	22. 5
9.20	2.8	0.0113	0.7111E+01	0.2570E+01	0.0	0.1512E+02	23.2	131.4	0.5197	12.1	11.1	0.756E+02	19. 5

TOTAL INTERNAL ENERGY = 0.3385E+06 TOTAL SWITCH ENERGY = 0.2054E-04 TOTAL EXT. ENERGY = 0.2054E+04

FRACTION OF ENERGY DUMPED IN HE = 0.993968 INTEGRAL CURRENT SQUARED DT = 0.2054E+06

MAX TEMPERATURE RISE = 131.38 MAX INTERNAL VOLTAGE = 857.46 TIME CONSTANT = 4.400000

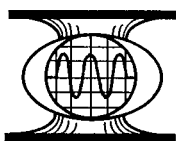
ONLY 52.0 % OF COIL VOLUME GOES NORMAL.

"QMIEND1, QUENCH SIMULATION FOR MICE END1 MAGNET, JULY 07, 2006"
60.,200,300,3000,10
1,5
.80,0.455E-11,"99.999 COPPER"
3
0.0,0.12E-7,0,0.118E-12,3.25,0.71E-5,3.029,0,0
40,0.141E-11,2.71,0,0,0.834E-3,1.74,0,0
80,0.467E-9,1.45,0,0,0.2636,0.4235,0,0
0
9.,111.8
59.,.017842,4.2
.20,900,0
0.0001,0.0001,5.9599,162.106,11.0642,2.98,81.053,5.5321
249.5,0.010,0,1000000,10.522,0

APPENDIX II-15-4

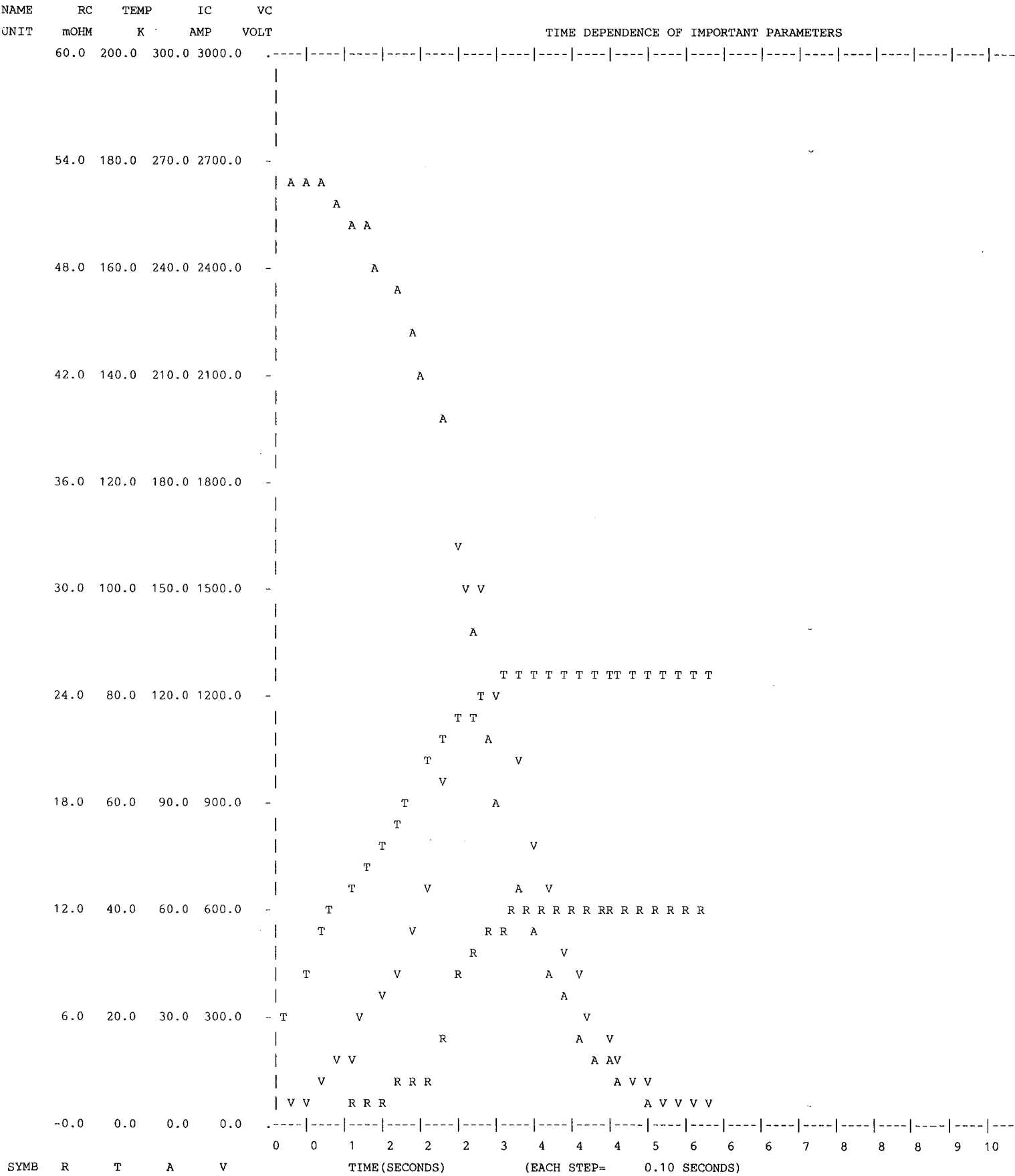
Analysis of Quench Center Coil

For MICE Spectrometer Solenoid Magnets



Wang NMR, Inc.

550 North Canyons Parkway , Livermore, Ca. 94551



QCENTER, QUENCH SIMULATION FOR MICE CENTER MAGNET(half), JULY 07, 2006
(FILD=DRHOC*AMP effective)

COMPONENT PROPERTIES

COMPONENT : 99.999 COPPER DRHOC : 4.55E-12

FRAC	THETA	A	AEX	B	BEX	C	CEX	D	DEX
0.8000	0.00	12.0000E-09	0.0000	11.8000E-14	3.2500	71.0000E-07	3.0290	0.0000E+00	0.0000
0.8000	40.00	14.1000E-13	2.7100	0.0000E+00	0.0000	83.4000E-05	1.7400	0.0000E+00	0.0000
0.8000	80.00	46.7000E-11	1.4500	0.0000E+00	0.0000	26.3600E-02	0.4235	0.0000E+00	0.0000

CRIT. TEMP. AT 0 FIELD : 9.0 DEG. KELVIN [THMAX]
MAX. FIELD AT TEMP THET : 111.8 K GAUSS [BMAX]
PEAK FIELD ON CONDUCTOR : 42.00 KGAUSS [FIED]
UNIT CELL AREA (WITH AMPS AMPO) : 0.0178 cm^2 [AR]
INITIAL TEMP THET : 4.20 DEG. KELVIN [THET]

INITIAL CURRENT = 265.90 [AMPO]
INITIAL PROT.R. = 0.0100 [RPR]
GAMMA = 0.00 [GAM]
R. SWITCH = 1000000.00 [RSW]
COIL INDUCTANCE = 10.8713 [HEN]
COIL INIT RESIS = 0.0000 [RO]

INITIAL VELOCITY = 2909.94 [VO]
UNIT CELL AREA = 0.017842 [AR]
INITIAL TEMPERATURE = 4.2000 [THET]
ALPHA = 0.00010 [AL1]
INITIAL X. VELOCITY = 29.0994 [VOX]
EPSILON = 0.00010 [EPS1]
INITIAL Y. VELOCITY = 29.0994 [VOY]
X COIL DIMENSION = 2.22 [XLIM]
Y COIL DIMENSION = 162.11 [YLIM]
Z COIL DIMENSION = 131.43 [ZLIM]
COORD. OF SOURCE X = 1.06 [XO]
COORD. OF SOURCE Y = 81.05 [YO]
COORD. OF SOURCE Z = 65.71 [ZO]

BREAKER DELAY TIME = 0.00 [DTIM]
CONDUCTOR LENGTH = 2649163.75 [CONDL]
COIL VOLUME = 47266.38 [VOLTRU]

XM : 0.04 0.04 0.04 0.04 2.17 2.17 2.17 2.17
YM : 0.00 0.00 162.11 162.11 0.00 0.00 162.11 162.11
ZM : -0.00 131.43 -0.00 131.43 -0.00 131.43 -0.00 131.43

TIME	CURRENT	I/IO	COIL OHMS	DEL VOLUME	EXT.VOLT	DEL.INT.ENG	INT.VOLT	MAXTEMP	NORMFRAC	VINDUC	VUNBAL	POWER	VELOC
TIM	AMP	AMPF	RT	VOL(I)	VOLT	ER	VINT	THETA(1)	VFRAC	VINDUC	VUNBAL	POWR	V
0.20	264.9	0.9964	0.1833E+00	0.3340E+04	2.7	0.2591E+04	48.7	19.9	0.0707	3.6	45.1	0.130E+05	1586. 1
0.40	263.4	0.9907	0.2967E+00	0.9983E+03	2.6	0.4165E+04	78.6	28.7	0.0918	7.5	71.2	0.208E+05	1580. 5
0.60	261.3	0.9827	0.4324E+00	0.9377E+03	2.6	0.6001E+04	113.9	34.4	0.1116	13.0	100.9	0.300E+05	1571. 5
0.80	258.4	0.9718	0.5925E+00	0.9191E+03	2.6	0.8090E+04	154.8	38.9	0.1311	20.6	134.2	0.405E+05	1558. 5
1.00	254.5	0.9572	0.8079E+00	0.9048E+03	2.6	0.1079E+05	208.8	43.1	0.1502	31.7	177.0	0.539E+05	1541. 5
1.20	249.4	0.9379	0.1085E+01	0.8892E+03	2.5	0.1406E+05	276.1	47.5	0.1690	47.1	229.0	0.703E+05	1518. 5
1.40	242.8	0.9131	0.1428E+01	0.8702E+03	2.5	0.1777E+05	356.2	52.1	0.1874	67.2	289.0	0.888E+05	1487. 5
1.60	234.5	0.8819	0.1844E+01	0.8465E+03	2.4	0.2173E+05	447.6	56.8	0.2053	92.4	355.2	0.109E+06	1448. 5
1.80	224.4	0.8439	0.2334E+01	0.8172E+03	2.3	0.2567E+05	547.3	61.6	0.2226	122.4	424.9	0.128E+06	1399. 5
2.00	212.3	0.7982	0.2931E+01	0.7817E+03	2.2	0.2952E+05	657.7	66.3	0.2392	157.8	499.9	0.148E+06	1338. 5
2.20	195.0	0.7334	0.4403E+01	0.7392E+03	2.1	0.3967E+05	934.5	70.9	0.2548	238.7	695.9	0.198E+06	1266. 5
2.40	164.9	0.6200	0.8394E+01	0.6791E+03	2.0	0.6385E+05	1637.0	74.9	0.2692	441.2	1195.8	0.319E+06	1163. 5
2.60	136.8	0.5146	0.9235E+01	0.5740E+03	1.6	0.5020E+05	1522.6	77.9	0.2813	428.8	1093.8	0.251E+06	983. 5
2.80	109.7	0.4127	0.1075E+02	0.4763E+03	1.4	0.4025E+05	1470.9	80.5	0.2914	429.0	1041.9	0.201E+06	816. 5
3.00	87.2	0.3278	0.1117E+02	0.3820E+03	1.1	0.2692E+05	1226.3	82.4	0.2995	367.6	858.7	0.135E+06	654. 5
3.20	68.8	0.2586	0.1146E+02	0.3034E+03	0.9	0.1740E+05	998.4	83.6	0.3059	305.7	692.7	0.870E+05	520. 5
3.40	54.0	0.2032	0.1164E+02	0.2394E+03	0.7	0.1101E+05	800.3	84.4	0.3110	249.1	551.2	0.550E+05	410. 5
3.60	42.3	0.1593	0.1175E+02	0.1881E+03	0.5	0.6863E+04	635.0	84.9	0.3149	200.2	434.8	0.343E+05	322. 5
3.80	33.1	0.1246	0.1182E+02	0.1474E+03	0.4	0.4241E+04	500.7	85.2	0.3181	159.4	341.3	0.212E+05	253. 5
4.00	25.9	0.0974	0.1187E+02	0.1153E+03	0.3	0.2605E+04	393.2	85.4	0.3205	126.1	267.1	0.130E+05	198. 5
4.20	20.2	0.0760	0.1190E+02	0.9010E+02	0.3	0.1595E+04	308.0	85.5	0.3224	99.4	208.6	0.797E+04	154. 5
4.40	15.8	0.0593	0.1192E+02	0.7036E+02	0.2	0.9741E+03	240.9	85.6	0.3239	78.1	162.8	0.487E+04	121. 5
4.60	12.3	0.0463	0.1193E+02	0.5492E+02	0.2	0.5941E+03	188.2	85.6	0.3251	61.2	127.0	0.297E+04	94. 5
4.80	9.6	0.0361	0.1194E+02	0.4286E+02	0.1	0.3620E+03	147.0	85.6	0.3260	48.0	99.0	0.181E+04	73. 5
5.00	7.5	0.0282	0.1194E+02	0.3344E+02	0.1	0.2205E+03	114.7	85.6	0.3267	37.5	77.2	0.110E+04	57. 5
5.20	5.8	0.0220	0.1195E+02	0.2608E+02	0.1	0.1342E+03	89.5	85.6	0.3272	29.3	60.2	0.671E+03	45. 5
5.40	4.6	0.0172	0.1195E+02	0.2035E+02	0.1	0.8168E+02	69.9	85.7	0.3277	22.9	46.9	0.408E+03	35. 5
5.60	3.6	0.0134	0.1195E+02	0.1587E+02	0.0	0.4970E+02	54.5	85.7	0.3280	17.9	36.6	0.248E+03	27. 5
5.80	2.8	0.0104	0.1195E+02	0.1238E+02	0.0	0.3024E+02	42.5	85.7	0.3283	14.0	28.5	0.151E+03	21. 5

TOTAL INTERNAL ENERGY = 0.4074E+06 TOTAL SWITCH ENERGY = 0.1595E-04 TOTAL EXT. ENERGY = 0.1595E+04

FRACTION OF ENERGY DUMPED IN HE = 0.996101 INTEGRAL CURRENT SQUARED DT = 0.1595E+06

MAX TEMPERATURE RISE = 85.66 MAX INTERNAL VOLTAGE = 1636.97 TIME CONSTANT = 3.000000

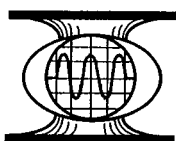
ONLY 32.8 % OF COIL VOLUME GOES NORMAL.

"QCENTER, QUENCH SIMULATION FOR MICE CENTER MAGNET(half), JULY 07, 2006"
60.,200,300,3000,10
1,5
.80,0.455E-11,"99.999 COPPER"
3
0.0,0.12E-7,0,0.118E-12,3.25,0.71E-5,3.029,0,0
40,0.141E-11,2.71,0,0,0.834E-3,1.74,0,0
80,0.467E-9,1.45,0,0,0.2636,0.4235,0,0
0
9.,111.8
42.,.017842,4.2
.20,900,0
0.0001,0.0001,2.2185,162.106,131.4298,1.0643,81.053,65.715
265.9,0.0100,0,1000000,10.87125,0

APPENDIX II-15-5

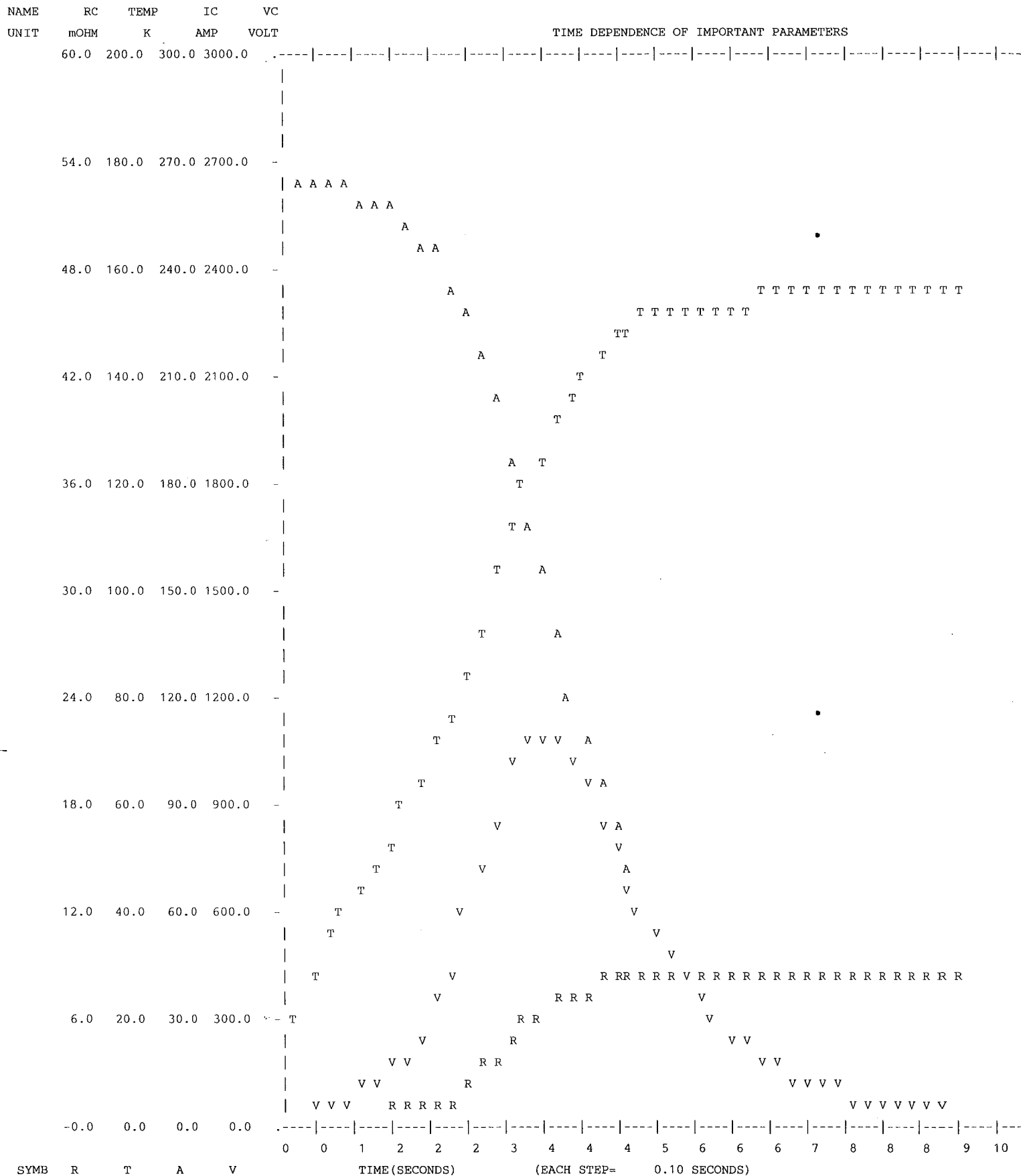
Analysis of Quench End2 Coil

For MICE Spectrometer Solenoid Magnets



Wang NMR, Inc.

550 North Canyons Parkway , Livermore, Ca. 94551



TIME	CURRENT	I/IO	COIL OHMS	DEL VOLUME	EXT.VOLT	DEL.INT.ENG	INT.VOLT	MAXTEMP	NORMFRAC	VINDUC	VUNBAL	POWER	VELOC
TIM	AMP	AMPF	RT	VOL(I)	VOLT	ER	VINT	THETA(1)	VFRAC	VINDUC	VUNBAL	POWR	V
0.20	264.8	0.9984	0.9051E-01	0.1657E+04	2.7	0.1273E+04	24.0	19.7	0.1400	3.7	20.3	0.636E+04	1582. 1
0.40	264.2	0.9961	0.1337E+00	0.2603E+03	2.6	0.1875E+04	35.4	28.6	0.1620	6.2	29.2	0.938E+04	1579. 2
0.60	263.3	0.9930	0.1954E+00	0.4325E+03	2.6	0.2728E+04	51.6	34.3	0.1986	10.8	40.8	0.136E+05	1576. 2
0.80	262.2	0.9888	0.2597E+00	0.2527E+03	2.6	0.3601E+04	68.4	38.9	0.2199	15.6	52.8	0.180E+05	1571. 5
1.00	260.8	0.9833	0.3494E+00	0.2406E+03	2.6	0.4805E+04	91.6	43.3	0.2402	22.6	69.0	0.240E+05	1564. 5
1.20	258.8	0.9760	0.4680E+00	0.2348E+03	2.6	0.6365E+04	122.0	47.9	0.2601	32.4	89.6	0.318E+05	1555. 5
1.40	256.3	0.9664	0.6216E+00	0.2307E+03	2.6	0.8329E+04	160.9	52.9	0.2796	45.7	115.2	0.416E+05	1544. 5
1.60	253.0	0.9540	0.8182E+00	0.2271E+03	2.6	0.1075E+05	209.7	58.3	0.2987	63.4	146.3	0.537E+05	1529. 5
1.80	248.8	0.9381	0.1066E+01	0.2233E+03	2.5	0.1365E+05	269.7	64.0	0.3176	86.5	183.2	0.682E+05	1509. 5
2.00	243.4	0.9179	0.1373E+01	0.2190E+03	2.5	0.1700E+05	341.7	70.1	0.3361	115.7	226.0	0.850E+05	1484. 5
2.20	236.8	0.8929	0.1747E+01	0.2139E+03	2.4	0.2071E+05	425.3	76.5	0.3542	151.5	273.8	0.104E+06	1452. 5
2.40	227.1	0.8565	0.2619E+01	0.2077E+03	2.4	0.2937E+05	620.1	84.3	0.3717	231.4	388.7	0.147E+06	1412. 5
2.60	215.9	0.8142	0.3170E+01	0.1991E+03	2.3	0.3271E+05	720.0	93.3	0.3886	280.7	439.4	0.164E+06	1355. 5
2.80	203.3	0.7665	0.3760E+01	0.1891E+03	2.2	0.3506E+05	811.8	102.2	0.4045	329.3	482.5	0.175E+06	1288. 5
3.00	187.2	0.7060	0.5079E+01	0.1779E+03	2.0	0.4198E+05	1032.6	110.9	0.4196	434.1	598.5	0.210E+06	1212. 5
3.20	170.4	0.6426	0.5774E+01	0.1638E+03	1.9	0.4048E+05	1081.0	118.8	0.4334	469.3	611.7	0.202E+06	1117. 5
3.40	153.4	0.5785	0.6421E+01	0.1490E+03	1.7	0.3730E+05	1094.2	125.9	0.4460	488.8	605.4	0.186E+06	1016. 5
3.60	136.9	0.5160	0.6942E+01	0.1341E+03	1.5	0.3268E+05	1065.0	131.9	0.4573	487.8	577.2	0.163E+06	915. 5
3.80	121.2	0.4571	0.7345E+01	0.1196E+03	1.4	0.2751E+05	1005.2	136.8	0.4674	470.5	534.7	0.138E+06	816. 5
4.00	106.6	0.4021	0.7741E+01	0.1059E+03	1.2	0.2275E+05	938.4	140.9	0.4764	447.6	490.8	0.114E+06	723. 5
4.20	93.4	0.3521	0.8010E+01	0.9316E+02	1.1	0.1822E+05	854.2	144.1	0.4843	414.2	440.0	0.911E+05	636. 5
4.40	81.4	0.3071	0.8223E+01	0.8155E+02	0.9	0.1434E+05	767.7	146.6	0.4911	377.5	390.2	0.717E+05	557. 5
4.60	70.8	0.2670	0.8389E+01	0.7112E+02	0.8	0.1113E+05	683.2	148.6	0.4972	340.0	343.1	0.556E+05	486. 5
4.80	61.4	0.2317	0.8517E+01	0.6184E+02	0.7	0.8544E+04	603.2	150.1	0.5024	303.4	299.8	0.427E+05	422. 5
5.00	53.2	0.2007	0.8615E+01	0.5366E+02	0.6	0.6506E+04	529.4	151.2	0.5069	268.7	260.7	0.325E+05	366. 5
5.20	46.0	0.1736	0.8690E+01	0.4647E+02	0.5	0.4923E+04	462.5	152.0	0.5108	236.5	226.0	0.246E+05	317. 5
5.40	39.8	0.1500	0.8747E+01	0.4019E+02	0.5	0.3707E+04	402.7	152.7	0.5142	207.3	195.4	0.185E+05	275. 5
5.60	34.3	0.1295	0.8790E+01	0.3473E+02	0.4	0.2781E+04	349.6	153.2	0.5172	181.0	168.6	0.139E+05	237. 5
5.80	29.6	0.1117	0.8822E+01	0.2998E+02	0.3	0.2081E+04	303.0	153.5	0.5197	157.6	145.3	0.104E+05	205. 5
6.00	25.6	0.0964	0.8846E+01	0.2587E+02	0.3	0.1554E+04	262.2	153.8	0.5219	137.0	125.2	0.777E+04	177. 5
6.20	22.0	0.0831	0.8865E+01	0.2231E+02	0.3	0.1158E+04	226.6	154.0	0.5238	118.8	107.8	0.579E+04	152. 5
6.40	19.0	0.0716	0.8878E+01	0.1924E+02	0.2	0.8626E+03	195.7	154.1	0.5254	102.9	92.8	0.431E+04	131. 5
6.60	16.4	0.0617	0.8889E+01	0.1659E+02	0.2	0.6417E+03	168.9	154.2	0.5268	89.1	79.8	0.321E+04	113. 5
6.80	14.1	0.0532	0.8896E+01	0.1429E+02	0.2	0.4771E+03	145.7	154.3	0.5280	77.0	68.7	0.239E+04	98. 5
7.00	12.2	0.0459	0.8902E+01	0.1232E+02	0.1	0.3546E+03	125.6	154.4	0.5291	66.5	59.1	0.177E+04	84. 5
7.20	10.5	0.0395	0.8907E+01	0.1061E+02	0.1	0.2634E+03	108.3	154.4	0.5300	57.5	50.8	0.132E+04	73. 5
7.40	9.0	0.0340	0.8910E+01	0.9145E+01	0.1	0.1956E+03	93.3	154.5	0.5307	49.6	43.7	0.978E+03	62. 5
7.60	7.8	0.0293	0.8913E+01	0.7879E+01	0.1	0.1452E+03	80.4	154.5	0.5314	42.8	37.6	0.726E+03	54. 5
7.80	6.7	0.0253	0.8915E+01	0.6787E+01	0.1	0.1078E+03	69.3	154.5	0.5320	36.9	32.4	0.539E+03	46. 5
8.00	5.8	0.0218	0.8916E+01	0.5847E+01	0.1	0.8002E+02	59.7	154.5	0.5325	31.8	27.9	0.400E+03	40. 5
8.20	5.0	0.0187	0.8917E+01	0.5037E+01	0.1	0.5939E+02	51.5	154.5	0.5329	27.5	24.0	0.297E+03	34. 5
8.40	4.3	0.0161	0.8918E+01	0.4339E+01	0.0	0.4407E+02	44.3	154.5	0.5333	23.7	20.7	0.220E+03	30. 5
8.60	3.7	0.0139	0.8919E+01	0.3738E+01	0.0	0.3271E+02	38.2	154.5	0.5336	20.4	17.8	0.164E+03	26. 5
8.80	3.2	0.0120	0.8919E+01	0.3220E+01	0.0	0.2427E+02	32.9	154.6	0.5338	17.6	15.3	0.121E+03	22. 5
9.00	2.7	0.0103	0.8920E+01	0.2774E+01	0.0	0.1801E+02	28.3	154.6	0.5341	15.2	13.2	0.901E+02	19. 5

TOTAL INTERNAL ENERGY = 0.4692E+06 TOTAL SWITCH ENERGY = 0.2195E-04 TOTAL EXT. ENERGY = 0.2195E+04

FRACTION OF ENERGY DUMPED IN HE = 0.995344 INTEGRAL CURRENT SQUARED DT = 0.2195E+06

MAX TEMPERATURE RISE = 154.56 MAX INTERNAL VOLTAGE = 1094.22 TIME CONSTANT = 4.200000

ONLY 53.4 % OF COIL VOLUME GOES NORMAL.

QEND2, QUENCH SIMULATION FOR MICE END2 MAGNET, JULY 07, 2006
(FILD=DRHOC*AMP effective)

COMPONENT PROPERTIES

COMPONENT : 99.999 COPPER DRHOC : 4.55E-12

FRAC	THETA	A	AEX	B	BEX	C	CEX	D	DEX
0.8000	0.00	12.0000E-09	0.0000	11.8000E-14	3.2500	71.0000E-07	3.0290	0.0000E+00	0.0000
0.8000	40.00	14.1000E-13	2.7100	0.0000E+00	0.0000	83.4000E-05	1.7400	0.0000E+00	0.0000
0.8000	80.00	46.7000E-11	1.4500	0.0000E+00	0.0000	26.3600E-02	0.4235	0.0000E+00	0.0000

CRIT. TEMP. AT 0 FIELD : 9.0 DEG. KELVIN [THMAX]
MAX. FIELD AT TEMP THET : 111.8 K GAUSS [BMAX]
PEAK FIELD ON CONDUCTOR : 63.70 KGAUSS [FIED]
UNIT CELL AREA (WITH AMPS AMPO) : 0.0178 cm^2 [AR]
INITIAL TEMP THET : 4.20 DEG. KELVIN [THET]

INITIAL CURRENT = 265.20 [AMPO]
INITIAL PROT.R. = 0.0100 [RPR]
GAMMA = 0.00 [GAM]
R. SWITCH = 1000000.00 [RSW]
COIL INDUCTANCE = 12.8850 [HEN]
COIL INIT RESIS = 0.0000 [RO]

INITIAL VELOCITY = 4337.75 [VO]
UNIT CELL AREA = 0.017842 [AR]
INITIAL TEMPERATURE = 4.2000 [THET]
ALPHA = 0.00010 [AL1]
INITIAL X. VELOCITY = 43.3775 [VOX]
EPSILON = 0.00010 [EPS1]
INITIAL Y. VELOCITY = 43.3775 [VOY]
X COIL DIMENSION = 6.60 [XLIM]
Y COIL DIMENSION = 162.11 [YLIM]
Z COIL DIMENSION = 11.06 [ZLIM]
COORD. OF SOURCE X = 3.30 [XO]
COORD. OF SOURCE Y = 81.05 [YO]
COORD. OF SOURCE Z = 5.53 [ZO]

BREAKER DELAY TIME = 0.00 [DTIM]
CONDUCTOR LENGTH = 663306.44 [CONDL]
COIL VOLUME = 11834.71 [VOLTRU]

XM : 0.00 0.00 0.00 0.00 6.60 6.60 6.60 6.60
YM : 0.00 0.00 162.11 162.11 0.00 0.00 162.11 162.11
ZM : 0.00 11.06 0.00 11.06 0.00 11.06 0.00 11.06

"QEND2, QUENCH SIMULATION FOR MICE END2 MAGNET, JULY 07, 2006"
60.,200,300,3000,10
1,5
.80,0.455E-11,"99.999 COPPER"
3
0.0,0.12E-7,0,0.118E-12,3.25,0.71E-5,3.029,0,0
40,0.141E-11,2.71,0,0,0.834E-3,1.74,0,0
80,0.467E-9,1.45,0,0,0.2636,0.4235,0,0
0
9.,111.8
63.7,.017842,4.2
.20,900,0
0.0001,0.0001,6.5984,162.106,11.0642,3.2992,81.053,5.5321
265.2,0.010,0,1000000,12.885,0