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Summary of the parametric sweep results

Generated by E. Ravaioli, TE-MPE-PE

steam-team@cern.ch

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Conductor parameters of magnet MQXFB07

Coil #	Cu/noCu ratio [-]	RRR [-]	Fil. twist-pitch [mm]	Ic at T4.22 K, B=12 T [A]
138	1.186	242	17.94	704
145	1.186	284	17.92	712
146	1.182	243	17.61	696
147	1.184	297	17.68	709

Simulation results of magnet MQXFB07 Peak voltages to ground [V]

Simulation of a quench at nominal current (16230 A).

Cases included in the parametric analysis:

- Case A: No failures
- Case B: QH1+QH3 circuit failures
- Case C: QH5+QH6 circuit failures
- Case D: CLIQ+QH2 circuit failures
- Case E: CLIQ+QH6 circuit failures
- Worst-case: Highest voltage to ground among above-mentioned cases.

Maximum expected coil voltage defined by electrical design criteria (e.d.c.): 670 V at nominal current (see EDMS 1963398).

Configurations resulting in peak voltage to ground higher than this value are highlighted in red.

	Electrical order	Case A	Case B	Case C	Case D	Case E	Worst-case	% wrt lowest	% wrt e.d.c.
1	146 147 138 145	531	586	617	629	573	629	+0%	-6%
2	138 147 146 145	546	602	634	629	573	634	+1%	-5%
3	146 145 147 138	530	584	619	577	634	634	+1%	-5%
4	146 147 145 138	533	586	619	575	635	635	+1%	-5%
5	138 146 147 145	525	581	606	638	567	638	+1%	-5%
6	138 145 146 147	543	600	630	638	565	638	+2%	-5%
7	146 145 138 147	528	584	614	639	565	639	+2%	-5%
8	146 138 147 145	525	572	592	639	569	639	+2%	-5%
9	138 145 147 146	546	601	635	569	645	645	+3%	-4%
10	138 147 145 146	549	602	635	567	645	645	+3%	-4%
11	138 146 145 147	525	581	604	646	560	646	+3%	-4%
12	146 138 145 147	525	573	591	647	561	647	+3%	-3%
13	145 146 138 147	590	655	674	635	560	674	+7%	+1%
14	145 138 146 147	593	658	677	636	561	677	+8%	+1%
15	145 146 147 138	593	656	679	574	628	679	+8%	+1%
16	147 146 138 145	598	662	681	625	567	681	+8%	+2%
17	145 138 147 146	596	658	682	566	640	682	+8%	+2%
18	147 138 146 145	601	665	684	626	569	684	+9%	+2%
19	147 146 145 138	600	663	685	571	628	685	+9%	+2%
20	147 138 145 146	603	665	688	564	640	688	+9%	+3%
21	145 147 146 138	621	676	707	564	634	707	+12%	+6%
22	145 147 138 146	621	676	707	556	645	707	+12%	+6%
23	147 145 146 138	626	682	711	564	634	711	+13%	+6%
24	147 145 138 146	626	682	711	556	645	711	+13%	+6%

Simulation results of magnet MQXFB07 Hot-spot temperature [K]

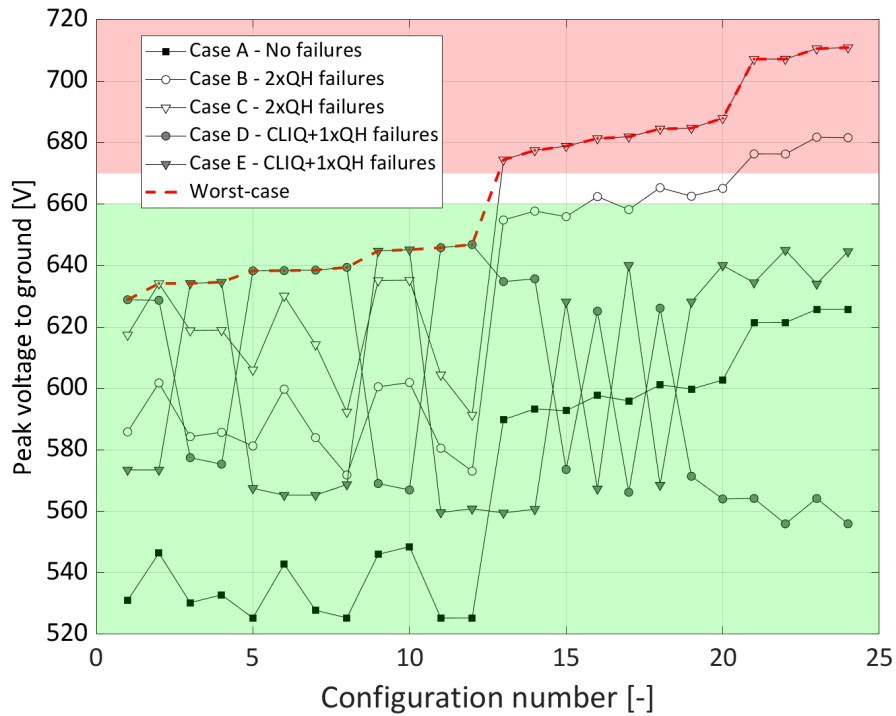
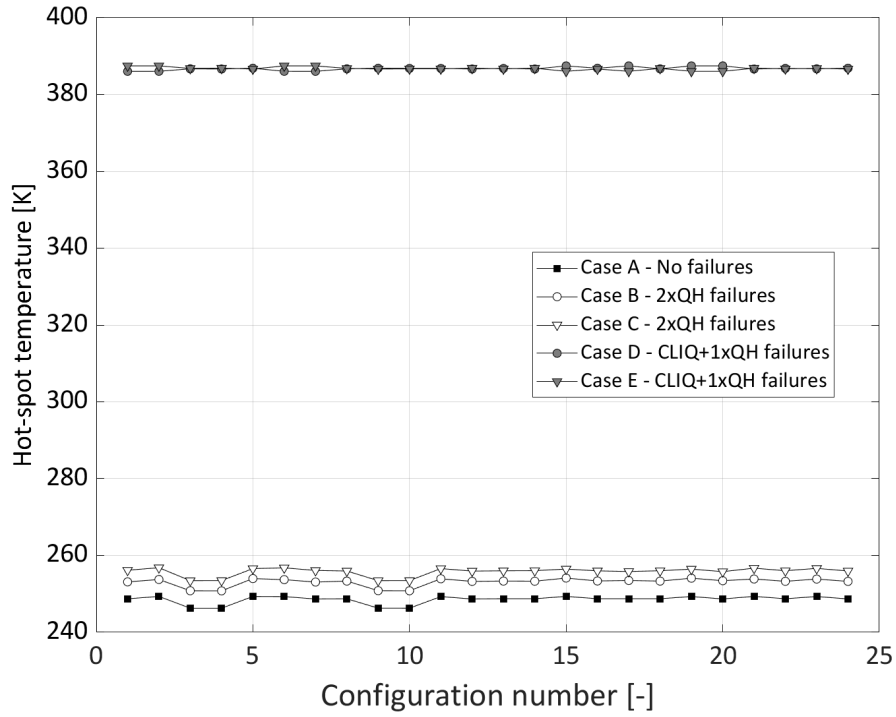
Simulation of a quench at nominal current (16230 A).

Cases included in the parametric analysis:

- Case A: No failures
- Case B: QH1+QH3 circuit failures
- Case C: QH5+QH6 circuit failures
- Case D: CLIQ+QH2 circuit failures
- Case E: CLIQ+QH6 circuit failures
- Worst-case: Highest voltage to ground among above-mentioned cases.

	Electrical order	Case A	Case B	Case C	Case D	Case E	Worst-case	% wrt lowest
1	146 147 138 145	249	253	256	386	387	387	+0%
2	138 147 146 145	249	254	257	386	387	387	+0%
3	146 145 147 138	246	251	253	387	387	387	+0%
4	146 147 145 138	246	251	253	387	387	387	+0%
5	138 146 147 145	249	254	257	387	387	387	+0%
6	138 145 146 147	249	254	257	386	387	387	+0%
7	146 145 138 147	249	253	256	386	387	387	+0%
8	146 138 147 145	249	253	256	387	387	387	+0%
9	138 145 147 146	246	251	253	387	387	387	+0%
10	138 147 145 146	246	251	253	387	387	387	+0%
11	138 146 145 147	249	254	257	387	387	387	+0%
12	146 138 145 147	249	253	256	387	387	387	+0%
13	145 146 138 147	249	253	256	387	387	387	+0%
14	145 138 146 147	249	253	256	387	387	387	+0%
15	145 146 147 138	249	254	256	387	386	387	+0%
16	147 146 138 145	249	253	256	387	387	387	+0%
17	145 138 147 146	249	253	256	387	386	387	+0%
18	147 138 146 145	249	253	256	387	387	387	+0%
19	147 146 145 138	249	254	256	387	386	387	+0%
20	147 138 145 146	249	253	256	387	386	387	+0%
21	145 147 146 138	249	254	257	387	387	387	+0%
22	145 147 138 146	249	253	256	387	387	387	+0%
23	147 145 146 138	249	254	257	387	387	387	+0%
24	147 145 138 146	249	253	256	387	387	387	+0%

Simulation results of magnet MQXFB07



Simulation results of magnet MQXFB07 Configuration [146 147 138 145]

Simulation of a quench at nominal current (16230 A).

For this selected configuration, the following cases were analyzed:

- Case 1: No failures
- Cases 2-12: 2xQH circuit failures (different locations)
- Case 13: CLIQ failure
- Cases 14-21: CLIQ + 1xQH circuit failures (different locations)

