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Summary of the parametric sweep results

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Conductor parameters of magnet MQXFB08

Coil #	Cu/noCu ratio [-]	RRR [-]	Fil. twist-pitch [mm]	Ic at T4.22 K, B=12 T [A]
148	1.165	250	18.24	712
149	1.19	268	18.71	712
150	1.174	254	18.84	717
151	1.182	246	18.36	714

Simulation results of magnet MQXFB08 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	148 151 149 150	526	584	614	596	605	614	+0%	-8%
2	148 150 149 151	532	590	621	603	599	621	+1%	-7%
3	148 149 150 151	540	594	627	600	603	627	+2%	-6%
4	148 149 151 150	541	595	629	596	608	629	+2%	-6%
5	148 151 150 149	525	583	610	635	560	635	+3%	-5%
6	148 150 151 149	530	590	618	636	560	636	+4%	-5%
7	151 148 150 149	555	618	642	632	557	642	+5%	-4%
8	150 148 151 149	557	619	643	634	557	643	+5%	-4%
9	151 148 149 150	558	620	645	593	602	645	+5%	-4%
10	150 148 149 151	558	620	646	600	596	646	+5%	-4%
11	150 151 148 149	564	624	647	633	560	647	+5%	-3%
12	150 151 149 148	563	622	651	572	633	651	+6%	-3%
13	151 150 148 149	566	627	653	633	559	653	+6%	-3%
14	151 150 149 148	568	628	657	571	633	657	+7%	-2%
15	150 149 148 151	577	633	664	599	603	664	+8%	-1%
16	151 149 148 150	577	633	664	592	608	664	+8%	-1%
17	151 149 150 148	576	632	664	569	636	664	+8%	-1%
18	150 149 151 148	578	633	665	571	636	665	+8%	-1%
19	149 148 150 151	603	665	686	595	596	686	+12%	+2%
20	149 148 151 150	603	666	688	590	602	688	+12%	+3%
21	149 151 148 150	611	672	691	589	605	691	+13%	+3%
22	149 151 150 148	608	668	691	566	633	691	+13%	+3%
23	149 150 148 151	614	674	698	596	599	698	+14%	+4%
24	149 150 151 148	615	675	700	568	633	700	+14%	+4%

Simulation results of magnet MQXFB08 Hot-spot temperature [K]

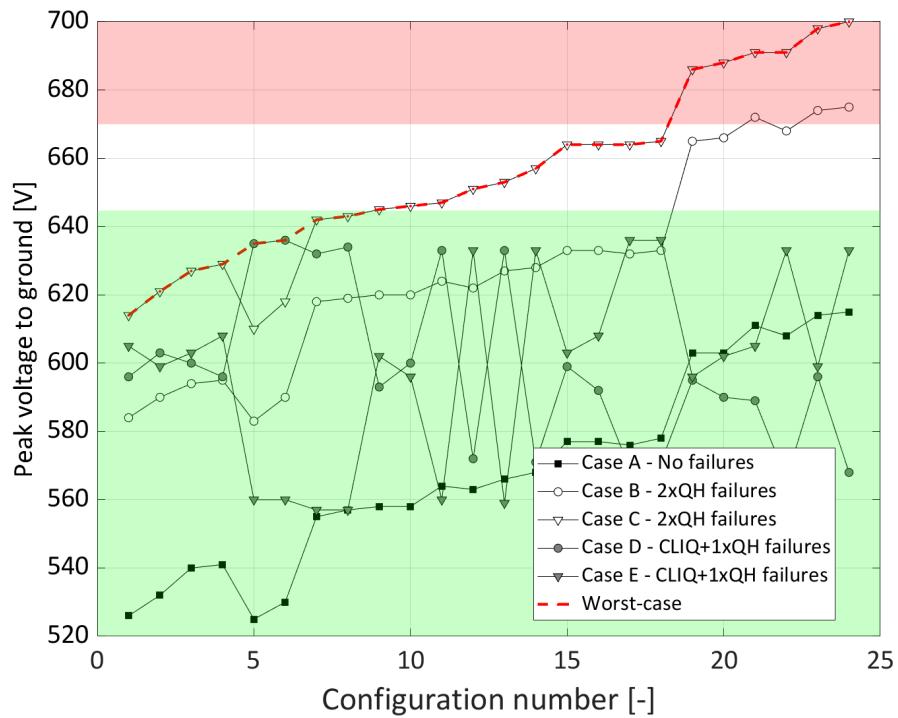
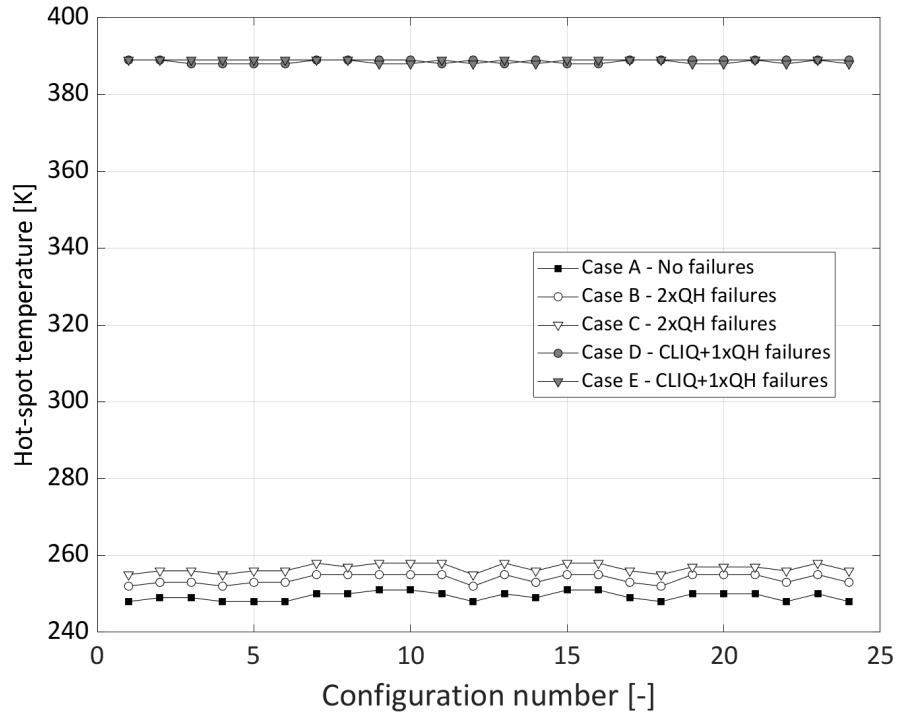
Simulation of a quench at nominal current (16230 A).

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	148 151 149 150	248	252	255	389	389	389	+0%
2	148 150 149 151	249	253	256	389	389	389	+0%
3	148 149 150 151	249	253	256	388	389	389	+0%
4	148 149 151 150	248	252	255	388	389	389	+0%
5	148 151 150 149	248	253	256	388	389	389	+0%
6	148 150 151 149	248	253	256	388	389	389	+0%
7	151 148 150 149	250	255	258	389	389	389	+0%
8	150 148 151 149	250	255	257	389	389	389	+0%
9	151 148 149 150	251	255	258	389	388	389	+0%
10	150 148 149 151	251	255	258	389	388	389	+0%
11	150 151 148 149	250	255	258	388	389	389	+0%
12	150 151 149 148	248	252	255	389	388	389	+0%
13	151 150 148 149	250	255	258	388	389	389	+0%
14	151 150 149 148	249	253	256	389	388	389	+0%
15	150 149 148 151	251	255	258	388	389	389	+0%
16	151 149 148 150	251	255	258	388	389	389	+0%
17	151 149 150 148	249	253	256	389	389	389	+0%
18	150 149 151 148	248	252	255	389	389	389	+0%
19	149 148 150 151	250	255	257	389	388	389	+0%
20	149 148 151 150	250	255	257	389	388	389	+0%
21	149 151 148 150	250	255	257	389	389	389	+0%
22	149 151 150 148	248	253	256	389	388	389	+0%
23	149 150 148 151	250	255	258	389	389	389	+0%
24	149 150 151 148	248	253	256	389	388	389	+0%

Simulation results of magnet MQXFB08



Simulation results of magnet MQXFB08 Configuration [148 151 149 150]

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)

