

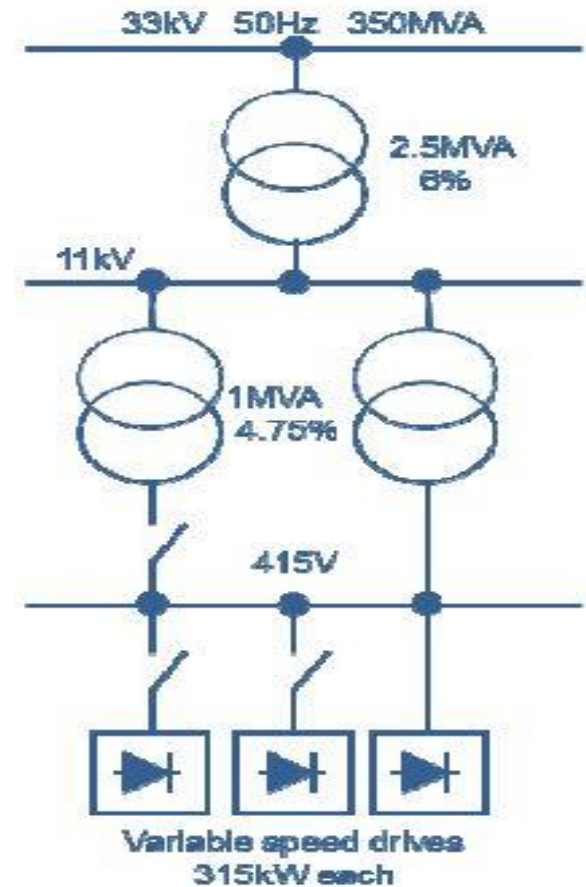


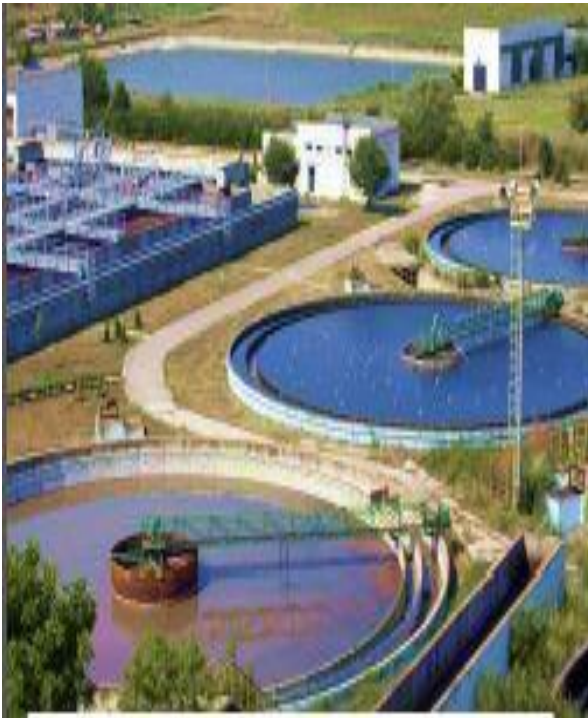
# Optimized Design Saved Money and Ensured Superior Performance

**Success Story - Samalaju Water Treatment Plant**

[www.meruspower.com](http://www.meruspower.com)

- Short-circuit level at 33kV is 350MVA. Supplying transformer from 33kV to 11kV is 2.5MVA with  $z_k$  of 6%.
- Transformers from 11kV to 415V are 1.0MVA having a short-circuit impedance of 4.75%.
- 3 Variable speed drives each of 315kW, one is working whereas, remaining two are standby.





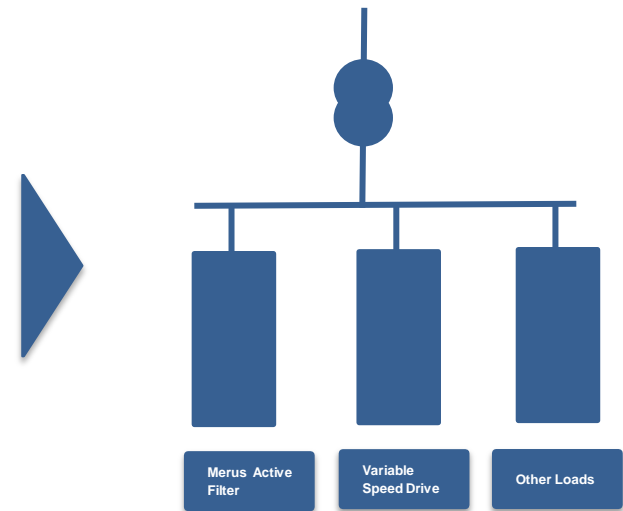
- **Reliability and Availability:**

Harmonic distortions should be below the limits specified by IEEE 519 1992.

- **Design Challenge:**

- **Active Front End Drive Vs Active Filter and 6-Pulse Drive**

- Merus Power offered **2 x A200** Active harmonic filters.
- Merus Active filters were installed parallel to the load to be compensated which in this case are variable speed drives.



# Harmonic Currents With and Without Mitigation



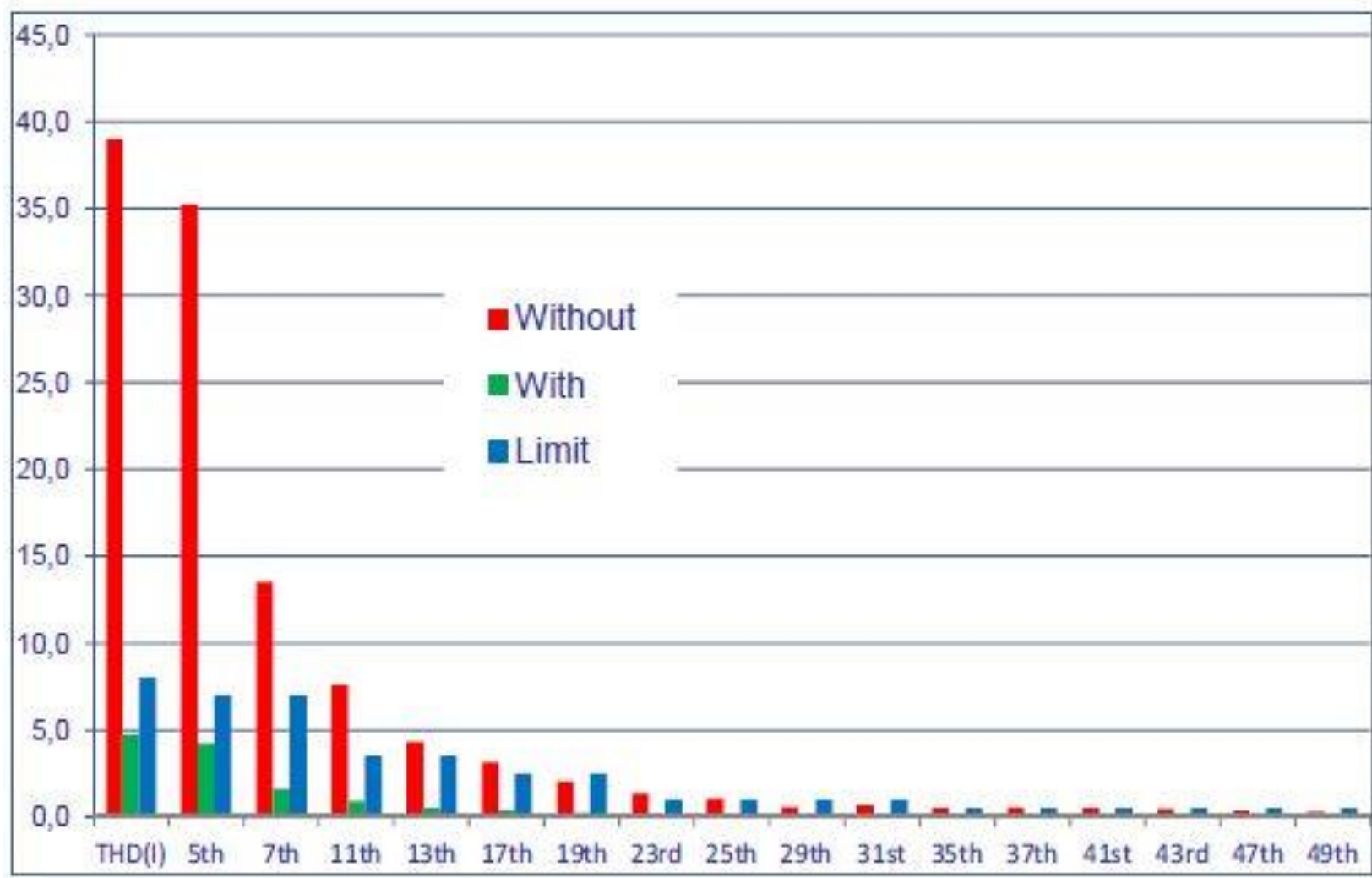
Without mitigation. Load 100%

Harmonic	Current	Current	Limit	Within
n	A	%	%	the limit
1	438,0	100,0		Yes / No
5	154,2	35,2	7,0	No
7	59,3	13,5	7,0	No
11	33,2	7,6	3,5	No
13	19,0	4,3	3,5	No
17	13,9	3,2	2,5	No
19	8,9	2,0	2,5	Yes
23	5,9	1,3	1,0	No
25	4,5	1,0	1,0	No
29	2,6	0,6	1,0	Yes
31	2,9	0,7	1,0	Yes
35	2,2	0,5	0,5	Yes
37	2,4	0,6	0,5	No
41	2,1	0,5	0,5	Yes
43	1,9	0,4	0,5	Yes
47	1,6	0,4	0,5	Yes
49	1,3	0,3	0,5	Yes
THD(I)	170,7	39,0	8,0	No

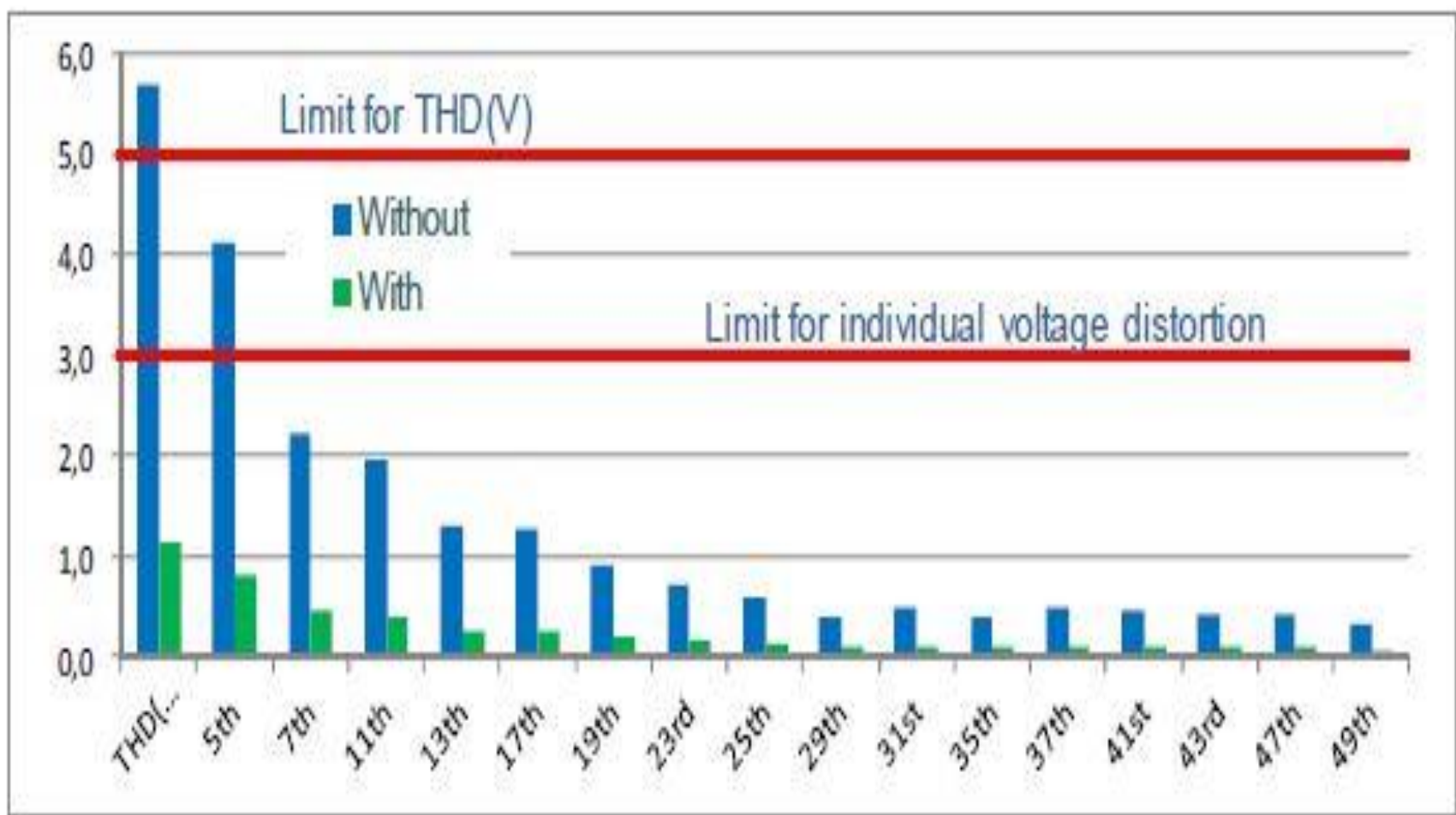
With Merus A200 active filter mitigation. Load 100%

Harmonic	Current	Current	Limit	Within
n	A	%	%	the limit
1	438,0	100,0		Yes / No
5	18,5	4,2	7,0	Yes
7	7,1	1,6	7,0	Yes
11	4,0	0,9	3,5	Yes
13	2,3	0,5	3,5	Yes
17	1,7	0,4	2,5	Yes
19	1,1	0,2	2,5	Yes
23	0,7	0,2	1,0	Yes
25	0,5	0,1	1,0	Yes
29	0,3	0,1	1,0	Yes
31	0,4	0,1	1,0	Yes
35	0,3	0,1	0,5	Yes
37	0,3	0,1	0,5	Yes
41	0,3	0,1	0,5	Yes
43	0,2	0,1	0,5	Yes
47	0,2	0,0	0,5	Yes
49	0,2	0,0	0,5	Yes
THD(I)	20,5	4,7	8,0	Yes

# Current Distortions with and without mitigation at 100% loading



# Voltage Distortions with and without mitigation at 100% loading





- **Technically and economically optimized design**
- **Lower capital expenditures by rightly sized equipment**
- **Seamless plant operation with high reliability and availability**
- **Extended plant lifetime**
- **Compliance to global power quality standards e.g. IEEE 519 1992 standards**