Corrections to Published Test Result for Test System No.1: A 14-Bus Balanced Transmission System [1]

- **Voltage Base of Bus 6**: In Table 1.1 in [1], the nominal voltage base specified for bus 6 is 230 kV. However, this bus belongs to the 115 kV voltage area as highlighted below.

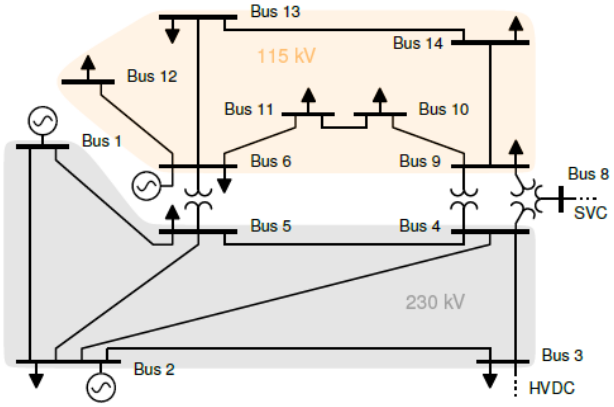

Figure 1 14 Bus Transmission System with main voltage areas highlighted [2].

- **vTHD results for buses 301 and 302**:
  An independent benchmark activity [2] identified that the original vTHD results published in [1] for buses 301 and 302 present the numbers for a scenario in which the harmonics cancellation introduced by the connection of transformers 3-301 and 3-302 is **removed**.

  The results for such scenario are available in the Hamonics Modeling and Simulation Task Force website – see file "Case1CS", column AP of "Buses" worksheet.

  While there is no available resource for the actual vTHD numbers for the scenario with harmonics cancellation considering the harmonics simulation engine utilized in [1], in [2], two independent tools identified very similar numbers amongst themselves, as shown below. Those numbers can be utilized as reference for other simulation tools benchmarking against [1].

Bus	Benchmark (%)	OpenDSS		PSSE	
		vTHD (%)	Diff (%)	vTHD (%)	Diff (%)
1	1.7666	1.7633	0.0033	1.8014	-0.0347
2	2.1768	2.1737	0.0031	2.1839	-0.0071
3	1.5156	1.5120	0.0036	1.5121	0.0035
4	0.7546	0.7510	0.0036	0.7929	-0.0384
5	1.4621	1.4593	0.0028	1.4686	-0.0065
6	0.4685	0.4666	0.0018	0.4636	0.0049
7	0.4230	0.4153	0.0078	0.4052	0.0179
8	0.5220	0.5156	0.0065	0.5154	0.0067
9	0.4822	0.4766	0.0057	0.4348	0.0474
10	0.4208	0.4158	0.0050	0.3760	0.0448
11	0.3937	0.3903	0.0034	0.3712	0.0224
12	0.3908	0.3888	0.0020	0.3843	0.0064
13	0.3763	0.3742	0.0022	0.3660	0.0104
14	0.3429	0.3387	0.0042	0.3132	0.0297
301	9.1688	4.0842	5.0847	4.1282	5.0406
302	9.1688	4.1284	5.0404	4.0848	5.0841

Figure 2 vTHD results comparison [2].

References:

[1] R. Abu-Hashim et al., "Test systems for harmonics modeling and simulation," in IEEE Transactions on Power Delivery, vol. 14, no. 2, pp. 579-587, April 1999, doi: 10.1109/61.754106.

[2] C. Rocha, A. Ovalle, R. Arritt, R. Dugan, and K. Patil. " Benchmarking Test Systems for Harmonics Modeling and Simulation against Open Source and Commercial Tools," *2024 IEEE Power & Energy Society General Meeting (PESGM)*, Seattle, WA, USA, 2024.