



# 1. Electrical features of the network of RTE (corresponding to the so called « static grid model » of RTE)

## 1.1 General principles of the publication

The attached excel file gives a list of very high voltage grid elements (400 and 225 kV overhead lines and 400/225 kV autotransformers) which are identified with geographical names (French names of the substations) and associated with their electrical features that are used to model the network.

The order is alphabetical. The publication is updated every year.

This frame is based on a common work of the TSO's of CWE region (Austria, Belgium, France, Germany, Netherlands). Some part are non-filled on RTE's side because non relevant for RTE.

## 1.2 Lines (Internal Lines & TieLines)

Concerning the overhead lines, the publication provided deal with:

- Interconnectors with Belgium, Germany and Italy (the publication is agreed with those TSOs);
- The assets that are strictly the property of RTE. Indeed, RTE cannot publish some information related to other owners which are connected to the network.

An example of the table related to the lines is given below:

Circuit name	Substation 1		Substation 2		Voltage level (kV)	Maximum Current I <sub>max</sub> (A)				Dynamic line rating (DLR)		Electrical Parameters				Length (m)
	Full name	Short name	Full name	Short name		Summer	Interseason 1	Interseason 2	Winter 1	DLR <sub>min</sub> (kA)	DLR <sub>max</sub> (kA)	Resistance R (Ω)	Reactance X (Ω)	Capacity (nF)	Half-Susceptance (μS)	
LIT 225kV NO 1 AIRVALLT-BONNEAU	AIRVALLT	AIRVA	BONNEAU	BONNE	225	932	932	1145	1145			3.064	20.350	762.736	19.810	52792
LIT 225kV NO 1 AIRVALLT-JUMEAUX(LES)	AIRVALLT	AIRVA	JUMEAUX(L)	JUMEA	225	1249	1337	1337	1434			0.330	2.212	50.501	7.933	5507
LIT 225kV NO 1 ALBERTVILLE-CHAVANOD	ALBERTVILLE	ALBER	CHAVANOD	CHAVI	225	617	689	689	742			4.460	17.210	17.210	60.000	42158
LIT 225kV NO 1 ALBERTVILLE-CONTAMINE	ALBERTVILLE	ALBER	CONTAMINE	CONTA	225	669	673	673	765			2.352	10.043	225.097	35.358	24626

Where the columns give the following piece of information:

- “Circuit name”: the link or overhead line is identified by its nominal voltage level and its geographical location (two substations defining its ends that can be read in the ENTSO-E map);
- Substation 1 & Substation 2 : RTE codification for lines extremities ;
- Maximal Current I<sub>max</sub> (A) respectively Summer 1, Interseason 1, Interseason 2 and Winter 1”: “Intensités de Secours Temporaires” (Maximum currents that the line can withstand during a time limit) given in ampere for four seasons defined by RTE which are respectively summer (21<sup>st</sup> May – 1<sup>st</sup> October), in-between season 1 (1<sup>st</sup> October – 31<sup>st</sup> October), in-between season 2 (10<sup>th</sup> April – 21<sup>st</sup> May) and winter (31<sup>st</sup> October – 10<sup>th</sup> April). Dates can differ for the interconnectors;
- “Rd”: direct resistance in ohm;
- “Xd”: direct reactance in ohm;
- “Cd”: direct capacity in nanofarad;
- “Hd/2”: semi-susceptance in microsiemens;
- “Longueur”: the length of the link in metre.

## 1.3 Auto-transformers (400/225 kV):

The attached file gives the electrical features of the Auto-Transformers of RTE (400/225 kV) and below is an example:

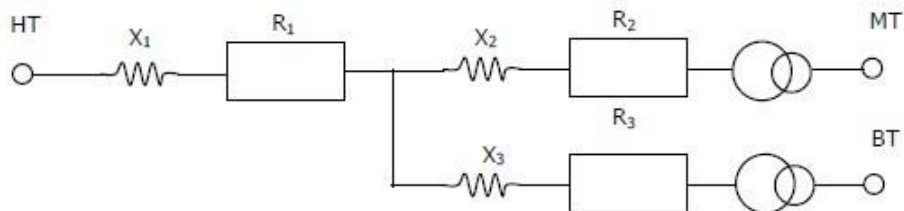
Location		Voltage Level U (kV)		Maximum Current I <sub>max</sub> (A) primary		Electrical Parameters							
Full Name	Short Name	Prim	Second	Summer Period	Winter Period	Rd1 à Prise moy / One-phase resistance at medium tap	Xd1 à Prise moy / One-phase reactance at medium tap	Rd2 à Prise moy / Two-phase resistance at medium tap	Xd2 à Prise moy / Two-phase reactance at medium tap	Rd3 à Prise moy / Three-phase resistance at medium tap	Xd3 à Prise moy / Three-phase reactance at medium tap	U1r sur Prise mm / Primary voltage	U2r sur Prise moy / Secondary voltage
TRANSF. 400/225kV 762 ALBERTVILLE	ALBER-762	400	225	1659	1803	0.24	43.1	0.28	-7.9	2.42	120.2	388	240
TRANSF. 400/225kV 763 ALBERTVILLE	ALBER-763	400	225	1575	1803	0.11	45.9	0.35	-10	5.47	123.1	388	240
TRANSF. 400/225kV 761 ARGIA (BAYONNE SUD)	ARGIA-761	400	225	1659	1803	0.17	42.4	0.31	-6.8	4.89	124.7	388	240

Where the columns give the following piece of information:

- “Location”: the transformer substation as it is located on ENTSO-E map and his French national codification;
- “Maximal Current I<sub>max</sub> Primary Summer Period”: Maximum currents that the line can withstand during a time limit in Summer season (10<sup>th</sup> April – 31<sup>st</sup> October);



- “Maximal Current  $I_{max}$  Primary Winter Period”: “Intensité de Secours Temporaire” Maximum currents that the line can withstand during a time limit in winter season (31<sup>st</sup> October – 10<sup>th</sup> April);
- “ $R_d(i)$ , respectively  $X_d(i)$ , à Prise moy”: resistance, respectively reactance, in direct ohm, with a nominal coupling and voltage for the primary circuit. The transformer with three windings can be modelled as followed:



- “ $U_{1r}$  sur Prise moy”: Nominal voltage for the primary circuit;
- “ $U_{2r}$  sur Prise moy”: Nominal voltage of the secondary circuit;
- Additional informations on Phase Shifting Transformers, not yet included in this frame on RTE’s side.