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OHSC --- Transmission Historical Outage Assessment						
Component Type	Voltage kV	Year	Momentary Frequency occ / 100 km / yr [See (1 & 3)]	Sustained Frequency occ / 100 km / yr [See (2 & 3)]	Average Duration hr / occ [See (5)]	Unavailability hr / yr [See (7)]
Circuit	500	1994	0.204	0.525	74.90	39.32
Circuit	230	1994	0.931	1.037	13.69	14.19
Circuit	115	1994	2.550	1.813	16.89	30.63
Circuit	500	1995	0.106	0.476	50.62	24.09
Circuit	230	1995	0.775	0.944	10.65	10.05
Circuit	115	1995	2.509	2.276	10.17	23.14
Circuit	500	1996	0.026	0.237	96.52	22.88
Circuit	230	1996	0.955	0.807	12.48	10.07
Circuit	115	1996	3.065	2.134	10.43	22.26
Circuit	500	1997	0.159	0.211	16.84	3.55
Circuit	230	1997	0.655	0.760	17.48	13.28
Circuit	115	1997	2.247	1.770	10.82	19.15
Circuit	500	1998	0.106	0.370	17.69	6.55
Circuit	230	1998	1.176	1.063	39.79	42.30
Circuit	115	1998	2.361	1.873	7.23	13.54

Component Type	Voltage	Year	Frequency	Average Duration	Unavailability
	kV		occ / yr	hr / occ	hr / yr
			[See (4)]	[See (6)]	[See (7)]
Transformer	500	1994	0.287	1039.48	298.33
Transformer	230	1994	0.243	154.09	37.44
Transformer	115	1994	0.369	162.94	60.12
Transformer	500	1995	0.286	566.65	162.06
Transformer	230	1995	0.283	57.27	16.21
Transformer	115	1995	0.337	118.23	39.84
Transformer	500	1996	0.158	1839.36	290.62
Transformer	230	1996	0.228	45.87	10.46
Transformer	115	1996	0.251	151.41	38.00
Transformer	500	1997	0.317	490.76	155.57
Transformer	230	1997	0.186	127.52	23.72
Transformer	115	1997	0.268	110.49	29.61
Transformer	500	1998	0.206	106.87	22.02
Transformer	230	1998	0.117	121.08	14.17
Transformer	115	1998	0.225	61.07	13.74

(1) Momentary forced outage refers to a circuit related forced outage with an actual duration less than 1 minute. Automatic reclosure events whose duration recorded as zero minute are included in this category.

(2) Sustained forced outage refers to a circuit related forced outage with duration one or more minutes.

(3) The system-wide momentary and sustained frequency for circuits were normalized to number of occurrences per 100 km of circuit length per year.

(4) The frequency of transformer outage is expressed as the number of forced outage occurrences per year.

(5) Average duration of circuit outage is expressed as hours per sustained forced outage occurrence.

(6) Average duration of transformer outage is expressed as hours per forced outage occurrence.

(7) Unavailability is expressed as the product of normalized sustained frequency and average duration.