

Table 4.6. U.S. Transmission Circuit and Transformer Outages by Type and NERC Region, 2010

	FRCC	MRO	NPCC	RFC	SERC	SPP	TRE	WECC	Contiguous U.S.	Contiguous U.S.
Circuit Outages										
AC										
Circuit Outage Counts										
Automatic Outages										
Momentary	96	110	35	231	281	115	121	444	1,433	44
Sustained	136	217	70	264	320	128	71	838	2,044	61
Non-Automatic Outages										
Operational	110	42	61	136	219	10	24	661	1,263	18
Planned	2,447	358	505	1,571	1,943	227	548	3,043	10,642	30
Circuit Outage Counts per 1,000 Circuit Miles										
Automatic Outages										
Momentary	13	6	5	9	8	15	13	7	8	11
Sustained	19	11	10	10	10	17	7	14	12	15
Non-Automatic Outages										
Operational	15	2	9	5	7	1	3	11	7	4
Planned	344	19	75	62	58	29	58	51	63	7
Circuit Outage Hours										
Automatic Outages										
Sustained Initiate	6,864	7,619	14,530	13,341	4,642	1,117	1,089	22,422	71,623	3,261
Non-Automatic Outages										
Operational	270	8	84	39	46	1	4	39	493	158
Planned	350	314	1,467	797	602	96	111	367	4,103	2,934
Circuit Outage Hours per Outage Incident[1]										
Automatic Outages										
Sustained Initiate	50	35	208	51	15	9	15	27	35	53
Non-Automatic Outages										
Operational	2	0	1	0.29	0.21	0.09	0.17	0.06	0	9
Planned	0.14	1	3	1	0.31	0.42	0.20	0.12	0	98
Transformer Outages										
Transformer Outage Counts										
Automatic Outages										
Momentary						9	-	20	29	
Sustained						53	-	55	108	
Non-Automatic Outages										
Operational						35	-	188	223	
Planned						316	-	214	530	
Transformer Outage Hours										
Automatic Outages										
Sustained						32,124	-	11,971	44,094	
Non-Automatic Outages										
Operational						275	-	30	305	
Planned						1,543	-	257	1,800	

Notes:

- [1] Circuit outage duration in hours per outage incident
- An Automatic Outage is an outage which results from the automatic operation of a switching device, causing an Element to change from an In-Service State to a not In-Service State.
 - Momentary Outage is an automatic outage with an outage duration less than one minute.
 - A Sustained Outage is an automatic outage with an outage duration of a minute or greater.
 - A Non-Automatic Outage is an outage which results from the manual operation (including supervisory control) of a switching device, causing an element to change from an In-Service State to a not In-Service State.
 - An Operational Outage is a Non-Automatic Outage for the purpose of avoiding an emergency (i.e., risk to human life, damage to equipment, damage to property) or to maintain the system within operational limits and that cannot be deferred.
 - A Planned Outage is a Non-Automatic Outage with advance notice for the purpose of maintenance, construction, inspection, testing, or planned activities by third parties that may be deferred.
 - Detailed information on the Transmission Availability Data System outage definitions is available at: <http://www.nerc.com/docs/pc/tadswg/Appendix%207%2020101202a%20clean.pdf>

Source: U.S. Energy Information Administration, Form EIA-411, "Coordinated Bulk Power Supply Program Report."