

Table 4.7.B. U.S. Transmission Circuit Sustained Automatic Outage Hours by Cause Code and by NERC Region, 2010

	AC & DC Circuit Outage Hours									Percent								
	FRCC	MRO	NPCC	RFC	SERC	SPP	TRE	WECC	Contiguous U.S.	FRCC	MRO	NPCC	RFC	SERC	SPP	TRE	WECC	Contiguous U.S.
Sustained Outage Causes																		
Weather, excluding lightning	-	2,050	21	568	849	668	0.05	4,626	8,782	-	22.3	0.1	4.1	18.3	59.8	0.0	19.5	11.7
Lightning	8	2	1	82	130	38	26	101	388	0.1	0.0	0.0	0.6	2.8	3.4	2.4	0.4	0.5
Environmental	-	2	-	8	202	-	-	11	222	-	0.0	-	0.1	4.3	-	-	0.0	0.3
Contamination	9	17	0.02	-	446	2	0.02	37	512	0.1	0.2	0.0	-	9.6	0.2	0.0	0.2	0.7
Foreign Interference	74	0.03	835	92	150	-	23	57	1,232	1.1	0.0	5.7	0.7	3.2	-	2.1	0.2	1.6
Fire	0.08	-	766	12	4	27	-	373	1,181	0.0	-	5.3	0.1	0.1	2.4	-	1.6	1.6
Vandalism, Terrorism, or Malicious Acts	-	-	-	-	-	-	-	18	18	-	-	-	-	-	-	-	0.1	0.0
Failed AC Substation Equipment	6,091	614	11,329	8,863	715	27	625	3,496	31,761	88.7	6.7	78.0	64.4	15.4	2.4	57.4	14.8	42.4
Failed AC/DC Terminal Equipment	-	812	-	429	-	-	-	9	1,250	-	8.8	-	3.1	-	-	-	0.0	1.7
Failed Protection System Equipment	36	38	223	396	223	5	50	116	1,086	0.5	0.4	1.5	2.9	4.8	0.5	4.6	0.5	1.5
Failed AC Circuit Equipment	521	4,742	1,235	2,489	1,380	90	342	3,353	14,152	7.6	51.5	8.5	18.1	29.7	8.1	31.4	14.2	18.9
Failed DC Circuit Equipment	-	56	-	-	-	-	-	47	102	-	0.6	-	-	-	-	-	0.2	0.1
Vegetation	-	-	27	4	115	4	-	78	228	-	-	0.2	0.0	2.5	0.4	-	0.3	0.3
Power System Condition	1	228	54	12	-	138	4	131	569	0.0	2.5	0.4	0.1	-	12.3	0.4	0.6	0.8
Human Error	9	457	12	48	244	0.20	6	318	1,095	0.1	5.0	0.1	0.3	5.3	0.0	0.6	1.3	1.5
Unknown	83	12	1	513	66	79	13	1,998	2,765	1.2	0.1	0.0	3.7	1.4	7.1	1.2	8.4	3.7
Other	32	174	26	253	118	39	0.15	8,899	9,542	0.5	1.9	0.2	1.8	2.5	3.5	0.0	37.6	12.7
TOTAL	6,864	9,204	14,530	13,770	4,642	1,117	1,089	23,669	74,884	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Notes:

• Detailed information on the Transmission Availability Data System outage causes 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."