

138 kV Transmission line Outage Statistics

Based on BC Hydro Northern Interior 138 kV Line Forced Outages from 2004-01-01 to 2013-12-31

Required Data	Answers	Comments
Supporting Structure Type (i.e. wood single/double pole, metal self-supporting, etc.)	Most lines use wood single or double poles, a few use metal self-supporting structures.	
Number of Circuits	28	
Sustained Forced Outage Frequency per year, per 100km	0.5432 (line related)	
Primary cause of sustained forced outages Adverse weather: Adverse weather, Lightning, Snow, Wind. Adverse environment: Adverse environment, Urban fire, Wild fire, Industrial pollution, Vibration. Defective equipment: Defective transmission line equipment. System conditions: Instability, Loop Flow Control, Over frequency, System Operating Limit Mitigation, Under frequency, Under voltage, Voltage Regulation. Human element: Personnel Incident	0.2570 (Line related) 0.0292 (Line related) 0.0876 (Line related) 0.0000 (Line related) 0.0058 (Line related)	
Momentary Forced Outage (<1min) Frequency per year, per 100km	1.5536	
Primary cause of momentary forced outage Adverse weather: Adverse weather, Lightning, Snow, Wind. Adverse environment: Adverse environment, Urban fire, Wild fire, Industrial pollution, Vibration. Defective equipment: Defective transmission line equipment. System conditions: Instability, Loop Flow Control, Over frequency, System Operating Limit Mitigation, Under frequency, Under voltage, Voltage Regulation. Human element: Personnel Incident	1.0747 0.0350 0.0117 0.0000 0.0058	

Fault Type and Number per year, per 100km <ul style="list-style-type: none"> (Line-Ground) – Number per year, per 100km (Line-Line) – Number per year, per 100km 		Can't calculate these types of outage stats since many outages have unknown fault type.
Momentary outage successful mitigations (i.e. single-pole reclosing, etc.)		No single-pole tripping and reclose protections on NI 138 kV lines
Average duration of forced outage (hour)	11.3 (Line related)	
Un-availability per year, per 100km (%)	0.0701 (Line related)	

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