

**Table 1: Voltage Limits and Operating Ranges and Limits<sup>1</sup>**

Substation Number and Name	Nominal Voltage (kV)	Minimum Operating Limit (kV)	Desired Range (kV)	Maximum Operating Limit (kV)
<b>AltaLink Management Ltd.</b>				
<b>5S East Calgary</b>	240	240	240 – 254	255
	138	138	138 – 142	142
<b>13S Deerland</b>	240	245	245 – 259	260
	138	140	140 – 144	145
<b>17S Benalto</b>	240	242	246 – 256	260
	138	138	138 – 144	145
<b>19S Wabamun</b>	138	140	140 – 144	145
<b>28S West Brooks</b>	240	245	245 – 260	264
	138	138	138 – 144	145
<b>37S North Calder</b>	240	240	244 – 255	260
	138	137	138 – 144	145
<b>38S East Edmonton</b>	240	240	240 – 253	255
	138	139	139 – 144	145
<b>39S Bickerdike</b>	240	255	258 – 263	264
	138	135	140 – 144	145
<b>41S Medicine Hat</b>	138	135	138 – 144	145
<b>42S Sarcee</b>	240	245	247 – 253	253
	138	138	138 – 142	142
<b>58S Edson</b>	138	138	138 – 144	145
<b>59S Peigan (TransAlta)</b>	240	235	235 – 258	264
	138	135	138 – 144	145
<b>62S Brazeau</b>	240	240	240 – 256	257
	138	140	140 – 144	145
<b>63S Red Deer</b>	240	240	245 – 256	257
	138	138	138 – 144	145
<b>64S East Crossfield</b>	240	240	240 – 254	255
	138	138	138 – 144	145
<b>68S Willesden Green</b>	240	243	245 – 256	264
<b>69S North Barrhead</b>	240	250	250 – 268	272
	138	140	140 – 144	145
<b>71S Lamoureux</b>	240	240	240 – 254	255
	138	140	140 – 144	145
<b>72S Leismer</b>	240	248	262 – 271	280

Substation Number and Name	Nominal Voltage (kV)	Minimum Operating Limit (kV)	Desired Range (kV)	Maximum Operating Limit (kV)
	144	138	140 – 146	150
74S Janet	240	246	248 – 254	264
	138	138	138 – 142	142
77S Sagitawah	240	250	250 – 263	264
	138	140	140 – 144	145
83S Taber	138	135	138 – 144	145
86S Bigstone	240	Left Blank <sup>2</sup>	243 – 253	260
	138	135	141 – 145	145
87S Gaetz	240	240	240 – 256	260
	138	138	138 – 144	145
89S Eilerslie	500	505	520 – 540	550
	240	243	246 – 254	255
102S Langdon	240	250	251 – 255	258
118s Canmore	138	139	139 - 144	145
132S Ware Junction	240	250	254 – 262	264
157S Lac La Biche	138	138	138 – 144	145
163S Amoco Empress	240	247	247 – 260	264
	138	140	140 – 144	145
244S Bowmanton	240	240	247 - 262	285
	138	138	139 - 144	150
250P Bighorn	138	135	135 – 148	150
267S Killarney Lake	138	138	138 – 144	145
268S Whitecourt	138	138	138 – 144	145
275S Jenner	240	250	250 – 260	264
305S Acheson	138	138	138 – 144	145
310P Sundance	240	252	255 – 262	264
	138	138	138 – 144	145
320P Keephills	500	512	520 – 540	550
	240	248	250 – 258	260
	138	138	138 – 144	145
321S Al Rothbauer	138	135	138 – 144	145
370S North Lethbridge	240	235	240 – 260	264
	138	135	138 – 144	145
377S Hardisty	138	140	140 – 144	145
391S Balzac	138	136	138 – 144	145
394S Empress	138	138	138 – 144	145
396S Pincher Creek	138	138	138 – 144	145
520s Bennett	500	510	510 - 535	540
523S Bullshead	138	135	138 – 144	145
535S Joffre	138	138	138 – 142	142
602S Cold Creek	138	136	137-148	149

Substation Number and Name	Nominal Voltage (kV)	Minimum Operating Limit (kV)	Desired Range (kV)	Maximum Operating Limit (kV)
648S Metiskow	240	250	250 – 260	260
	138	140	140 – 144	145
<b>ATCO Electric Ltd.</b>				
700S Bonnyville	144	133	146 – 153	155
715S Leming Lake	144	136	145 – 150	155
716S Lloydminster	144	130	140 – 150	151
722S Crystal Lake	144	138	146 – 152	155
730S Rycroft	144	131	138 – 152	155
732S Mitsue	240	245	258 – 267	275
	144	141	146 – 151	155
740S H.R. Milner	144	138	145 – 149	151
743S Sarah Lake	144	143	145 – 148	152
749S Flyingshot Lake	144	137	145 – 151	155
751S Hill	144	130	140 – 150	151
755S Cordel	240	253	254 – 257	260
757S Battle River	144	130	146 – 150	152
766S Nevis	240	246	248 – 255	265
	144	130	148 – 152	155
767S Oyen	144	130	141 – 148	152
780S Lubicon	144	143	147 – 151	155
786S High Level	144	142	144 – 150	155
788S Hotchkiss	144	143	150 – 154	155
789S Keg River	144	144	148 – 152	155
790S Poplar Hill	144	143	149 – 152	155
791S Rainbow Lake	144	145	148 – 151	155
793S West Peace River	144	145	150 – 153	155
800S Friedenstal	144	142	148 – 153	155
801S Anderson	240	255	257 – 262	275
	144	145	148 – 151	155
809S Louise Creek	240	249	260 – 268	275
	144	138	146 – 149	155
811S Clairmont Lake	144	139	148 – 153	155
813S Little Smoky	240	256	261 – 265	275
	144	147	149 – 151	155
815S Goodfare	144	142	149 – 153	155
825S Whitefish Lake	240	234	250 - 264	275
826S Marguerite Lake	240	229	248 – 265	275
	144	134	141 – 154	155
827S Cranberry Lake	144	135	147 – 151	155
834S Wesley Creek	240	259	265 – 270	275
	144	142	149 - 152	155

Substation Number and Name	Nominal Voltage (kV)	Minimum Operating Limit (kV)	Desired Range (kV)	Maximum Operating Limit (kV)
840S McNeill	230	219	231 – 248	248
	138	133	135 – 142	144
845S Big Mountain	144	137	144 – 150	155
848S Ruth Lake	240	259	262-270	275
	144	130	143 – 153	155
885S McMillian	240	235	260 – 275	275
	144	131	148 – 154	155
888S Dover	240	257	262 – 271	275
898S Heart Lake	240	234	255 – 268	275
	144	138	140 – 145	152
939S Livock	500	518	522-543	550
	240	242	251-276	286
951S Thickwood	500	517	522-544	550
	240	258	263-270	275
977S Salt Creek	240	248	262 – 270	275
	144	130	141– 153	155
<b>ENMAX</b>				
SS9	138	136	138 – 142	143
SS13	138	136	138 – 142	143
SS21	138	136	138 – 142	143
SS31	138	136	138 – 142	143
SS41	138	136	138 – 142	143
SS162 Beddington	240	239	242 – 255	256
	138	138	142 – 144	145
<b>EPCOR Distribution &amp; Transmission Inc.</b>				
52S East Industrial	240	240	245 – 254	255
557S Castledown	240	240	245 – 254	255
665S Dome	240	240	245 – 254	255
803S Lambton	240	240	245 – 254	255
805S Jasper Terminal	240	240	245 – 254	255
816S Petrolia	240	240	245 – 254	255
987S Clover Bar	240	240	245 – 254	255
814S Bellamy Terminal	240	Left Blank <sup>2</sup>	Left Blank <sup>2</sup>	255
Genesee 330P	500	518	525 – 540	550
	138	124	124 – 152	152

**Note:**

1. The AESO's Operations Coordination group may establish temporary limits with the owners of transmission facilities to accommodate outages.
2. Intentionally left blank. The 240 kV system is operated as required to maintain the 138 kV voltage within operating limits.

**Table 2: Fallback Minimum Voltage Limits Table(s)**

**Fort McMurray Area Minimum Voltage Limit<sup>1,2</sup>**

Substation	Nominal Voltage (kV)	Minimum Operating Limit (kV)
72S Leismer	240	246
	138	138
825S Whitefish Lake	240	246
848S Ruth Lake	240	248
	144	144
885S McMillan	240	246
	144	141
888S Dover	240	250
898S Heart Lake	240	245
	144	138
977S Salt Creek	240	246
	144	144

**Note:**

1. The Fort McMurray Area Minimum Voltage Limit Table is applied as a fallback limit when the VSA tool cannot provide a minimum Real Time Limit.
2. The Fort McMurray Area Minimum Voltage Limits are applied under Fort McMurray Area maximum transfer out conditions.