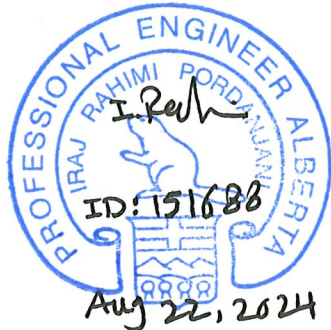


2024 Loss Factors

Role	Name, Title	Date	Signature
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Version: R3

Classification: Public



PERMIT TO PRACTICE INDEPENDENT SYSTEM OPERATOR	
RM SIGNATURE:	<i>I. Rahimi</i>
RM APEGA ID #:	<i>151688</i>
DATE:	<i>Aug 22, 2024</i>
PERMIT NUMBER: P008200	
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)	

2024 Loss Factors Revision History

Revision	Description of Revision	Date
R0	Initial Release	October 2, 2023
R1	Addition of project MPIDs RPT1 and RPT2	December 19, 2023
R2	Addition of project MPIDs 0000013111 and 0000043411	May 17, 2024
R3	Adjusted 2024 Loss Factors	August 22, 2024

2024 Loss Factors Effective 1 Sep 2024 (2024-08-22)

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Location (MPID)	Facility Name	Area Name	Number	PSS/E Bus	Final Loss Factor
0000001511	FortisAlberta Reversing POD - Fort Macleod (15S)	Fort Macleod	53	4237	12.00%
0000005511	FortisAlberta Reversing POD - Olds (55S)	Didsbury	39	3121	(1.37%)
0000006411	FortisAlberta Reversing POD - East Crossfield (64S)	Airdrie	57	—	(3.98%)
0000006511	FortisAlberta Reversing POD - High River (65S)	High River	46	4242	7.12%
0000006711	FortisAlberta Reversing POD - Stirling (67S)	Glenwood	55	4280	6.59%
0000006811	FortisAlberta Reversing POD - Willesden Green (68S)	Drayton Valley	30	—	(6.36%)
0000010711	FortisAlberta Reversing POD - Westfield (107S)	Vauxhall	52	4277	12.00%
0000012111	FortisAlberta Reversing POD - Brooks (121S)	Brooks	47	3256	8.89%
0000013111	FortisAlberta Reversing POD - Moon Lake (131S)*	Drayton Valley	30	4028	2.92%
0000013511	FortisAlberta Reversing POD - Conrad (135S)	Vauxhall	52	—	12.00%
0000013711	FortisAlberta Reversing POD - Sedgewick (137S)	Wainwright	32	4078	0.90%
0000015111	FortisAlberta Reversing POD - Strathmore (151S)	Strathmore	45	—	4.49%
0000015811	FortisAlberta Reversing POD - Vauxhall (158S)	Vauxhall	52	553274	8.82%
0000016301	FortisAlberta DOS - Plains Midstream Canada (163S)	Empress	48	262	(5.55%)
0000019811	FortisAlberta Reversing POD - Blackfalds (198S)	Red Deer	35	3113	2.92%
0000021311	FortisAlberta Reversing POD - Hughenden (213S)	Provost	37	-	0.83%
0000021411	FortisAlberta Reversing POD - Innisfail (214S)	Didsbury	39	557120	0.64%
0000022911	FortisAlberta Reversing POD - Glenwood (229S)	Glenwood	55	4245	7.47%
0000023511	FortisAlberta Reversing POD - Entwistle (235S)	Wabamun	40	—	(6.28%)
0000025411	FortisAlberta Reversing POD - Coaldale (254S)	Lethbridge	54	4690	10.74%
0000025511	FortisAlberta Reversing POD - Vulcan (255S)	Stavely	49	557120	12.00%
0000025611	FortisAlberta Reversing POD - Harmattan (256S)	Didsbury	39	124	(0.32%)
0000025711	FortisAlberta Reversing POD - Hull (257S)	Vauxhall	52	2401, 552402	10.16%
0000027511	FortisAlberta Reversing POD - Jenner (275S)	Empress	48	4986	12.00%
0000027711	FortisAlberta Reversing POD - Hayter (277S)	Provost	37	220	4.09%
0000029711	FortisAlberta Reversing POD - Rimbey (297S)	Red Deer	35	—	(0.70%)
0000033111	FortisAlberta Reversing POD - Ponoka (331S)	Wetaskiwin	31	4090	(12.00%)
0000034911	FortisAlberta Reversing POD - Stavely (349S)	Stavely	49	4235	12.00%
0000036811	FortisAlberta Reversing POD - Burdett (368S)	Vauxhall	52	2269	11.60%
0000038511	FortisAlberta Reversing POD - Spring Coulee (385S)	Glenwood	55	4246	11.47%
0000039411	FortisAlberta Reversing POD - Empress (394S)	Empress	48	—	5.69%
0000039611	FortisAlberta Reversing POD - Pincher Creek (396S)	Fort Macleod	53	4224	6.82%
0000042111	FortisAlberta Reversing POD - Hays (421S)	Vauxhall	52	4401	8.45%
0000042811	FortisAlberta Reversing POD - Namaka (428S)	Strathmore	45	—	5.03%
0000043411	FortisAlberta Reversing POD - Stony Plain (434S)*	Wabamun	40	3360 / 4360	2.92%
0000044711	FortisAlberta Reversing POD - Enchant (447S)	Vauxhall	52	—	10.12%
0000049211	FortisAlberta Reversing POD - Monarch (492S)	Lethbridge	54	—	8.44%
0000049811	FortisAlbertas Reversing POD - Tilley (498S)	Brooks	47	4275	8.02%
0000052611	FortisAlberta Reversing POD - Buffalo Creek (526S)	Wainwright	32	4079	(12.00%)
0000053511	FortisAlberta Reversing POD - Joffre (535S)	Red Deer	35	2383, 2886	0.86%
0000057411	FortisAlberta Reversing POD - Nilrem (574S)	Wainwright	32	19428	0.95%
0000058011	FortisAlbertas Reversing POD - Sylvan Lake (580S)	Red Deer	35	4780	(4.42%)
0000064911	FortisAlberta Chappice Lake 649S DER Solar (649S)	Medicine Hat	4	—	7.66%
0000065911	FortisAlberta Reversing POD - Pegasus (659S)	Swan Hills	26	325	(2.97%)
0000079301	FortisAlberta DOS - Cochrane EV Partnership (793S)	Seebe	44	191	12.00%
0000089511	FortisAlberta Reversing POD - Suffield (895S)	Medicine Hat	4	3270	6.24%
311S033N	ATCO Electric Reversing POD - Elmsworth (731S)	Grande Prairie	20	19134	(12.00%)
311S057N	ATCO Electric Reversing POD - Wapiti (823S)	Grande Prairie	20	19135	(1.54%)
311S065N	ATCO Electric Reversing POD - Goodfare (815S)	Grande Prairie	20	19119	(1.74%)
311S081N	ATCO Electric Reversing POD - Poplar Hill (790S)	Grande Prairie	20	18118	2.92%
311S089N	ATCO Electric Reversing POD - Mercer Hill (728S)	Grande Prairie	20	19109	(3.72%)
312S008N	ATCO Electric Reversing POD - Rycroft (730S)	Grande Prairie	20	19100	(12.00%)
312S025N	ATCO Electric Reversing POD - Mowat (2033S)	Grande Prairie	20	19116	(12.00%)
321S009N	ATCO Electric Reversing POD - Carmon (830S)	Peace River	19	19083	(6.79%)
321S033	ATCO Electric DOS - Mercer Peace River (839S)	Peace River	19	1088	12.00%
325S009N	ATCO Electric Reversing POD - Hotchkiss (788S)	Peace River	19	19050	(10.93%)
332S040N	ATCO Electric Reversing POD - Sarah Lake (743S)	Swan Hills	26	18266	(5.25%)
352S017N	ATCO Electric Reversing POD - Vermilion (710S)	Lloydminster	13	19383	2.92%
361S001N	ATCO Electric Reversing POD - Michichi Creek (802S)	Hanna	42	18448, 19448	9.48%
363S009N	ATCO Electric Reversing POD - Three Hills (770S)	Hanna	42	—	6.86%

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Location (MPID)	Facility Name	Area Name	Number	PSS/E Bus	Final Loss Factor
364S033N	ATCO Electric Reversing POD - Youngstown (772S)	Hanna	42	19476	2.53%
372S025N	ATCO Electric Reversing POD - Lindbergh (969S)	Cold Lake	28	1444	(12.00%)
374S009N	ATCO Electric Reversing POD - Vilna (777S)	Vegreville	56	—	(8.67%)
AFG1TX	APF Athabasca	Athabasca	27	392	(8.20%)
AKE1	McBride Lake Wind Facility	Fort Macleod	53	901	10.57%
ANC1	Alberta Newsprint	Swan Hills	26	298	0.86%
ARD1	Ardenville Wind Facility	Fort Macleod	53	739	7.40%
BAR	Barrier Hydro Facility	Seebe	44	216	0.41%
BCR2	Bear Creek #2	Grande Prairie	20	1142	(12.00%)
BCRK	Bear Creek #1	Grande Prairie	20	1142	(12.00%)
BIG	Bighorn Hydro Facility	Abraham Lake	34	103	1.80%
BKZ1	Solar Krafte Brooks	Brooks	47	434	6.46%
BPW	Bears paw Hydro Facility	Seebe	44	184	(0.45%)
BPW1	Buffalo Plains MPC Wind	Brooks	47	549041	5.25%
BR4	Battle River #4	Alliance	36	1491	4.52%
BR5	Battle River #5	Alliance	36	1469	3.46%
BRA	Brazeau Hydro Facility	Drayton Valley	30	153	0.53%
BSR1	Blackspring Ridge Wind Facility	Stavely	49	736	6.83%
BTR1	Blue Trail Wind Facility	Fort Macleod	53	328	7.29%
CAS	Cascade Hydro Facility	Seebe	44	175	(2.87%)
CAS1	Cascade Combined Cycle 1 (1047S)	Hinton/Edson	29	549014	3.55%
CAS2	Cascade Combined Cycle 2 (1047S)	Hinton/Edson	29	549014	3.54%
CES1/CES2	Calgary Energy Centre	Calgary	6	187	0.55%
CHIN	Chin Chute Hydro Facility	Lethbridge	54	406	8.73%
CLO1	Cenovus Christina Lake Industrial System	Fort McMurray	25	879	1.80%
CLR1	Claresholm Solar A Facility	Stavely	49	99004	12.00%
CLR2	Claresholm Solar B Facility	Stavely	49	99004	12.00%
CMH1	City of Medicine Hat	Medicine Hat	4	976	6.73%
CNR5	CNRL Horizon Industrial System	Fort McMurray	25	1263	4.15%
CR1	Castle River #1 Wind Facility	Fort Macleod	53	234	7.28%
CRE3	Cowley Ridge Wind Facility	Fort Macleod	53	264	8.72%
CRR1	Castle Rock Ridge Wind Facility	Fort Macleod	53	221	7.79%
CRR2	Castle Rock Ridge Phase 2 Wind Facility	Fort Macleod	53	221	7.75%
CRS1	Crossfield Energy Centre #1	Airdrie	57	503	2.74%
CRS2	Crossfield Energy Centre #2	Airdrie	57	503	3.19%
CRS3	Crossfield Energy Centre #3	Airdrie	57	503	3.28%
CYP1	Cypress Wind Project Connection (1019S)	Medicine Hat	4	549003	11.63%
CYP2	Cypress Wind Project Connection 2 (1019S)	Medicine Hat	4	549003	12.00%
DAI1	Daishowa-Marubeni	Peace River	19	1089	(3.63%)
DOWGEN15M	Dow Hydrocarbon Industrial Complex	Fort Saskatchewan	33	61	1.66%
DRW1	Drywood #1	Glenwood	55	4226	0.72%
EAGL	Whitecourt Power	Swan Hills	26	410	(3.88%)
EC01	Cavalier	Strathmore	45	340	1.31%
EC04	Foster Creek Industrial System	Cold Lake	28	1301	2.75%
EGC1	Shepard	Calgary	6	772	1.71%
ENC1	Clover Bar #1	Edmonton	60	516	0.85%
ENC2	Clover Bar #2	Edmonton	60	516	1.26%
ENC3	Clover Bar #3	Edmonton	60	516	1.12%
EPS1	Empress Industrial System	Empress	48	2266	2.92%
FH1	Fort Hills Industrial System	Fort McMurray	25	1612	2.11%
FMG1	Suncor Forty Mile Granlea WAGF (1024S)	Medicine Hat	4	994	12.00%
FNG1	Fort Nelson	Rainbow Lake	17	20000	10.60%
FRM1	RESC Forty Mile MPC Wind	Medicine Hat	4	608	12.00%
GDP1	TransAlta Garden Plain Wind (1045S)	Hanna	42	542002	7.96%
GHO	Ghost Hydro Facility	Seebe	44	180	(0.33%)
GNR1	Genesee Repower 1	Lake Wabamun	40	525	1.72%
GNR2	Genesee Repower 2	Lake Wabamun	40	525	1.72%
GN3	Genesee #3	Lake Wabamun	40	525	1.61%
GPEC	Grande Prairie EcoPower	Grande Prairie	20	1101	(5.45%)
GRZ1	Wild Run Grizzly Bear Wind (708S)	Lloydminster	13	1308	1.86%

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Location (MPID)	Facility Name	Area Name	Number	PSS/E Bus	Final Loss Factor
GWW1	Soderglen Wind Facility	Fort Macleod	53	358	7.70%
HAL1	Halkirk Wind Facility	Hanna	42	1435	6.56%
HHW1	BER Hand Hills MPC Wind (572S)	Hanna	42	549045	9.49%
HLD1	Hilda Wind Facility	Empress	48	540004	8.34%
HRM	H. R. Milner	Grande Cache	22	1147	(2.33%)
HRT1	Heartland Petrochemical Complex Industrial System	Fort Saskatchewan	33	—	0.70%
HSH	Horseshoe Hydro Facility	Seebe	44	171	(0.34%)
IEW1	Summerview 1 Wind Facility	Fort Macleod	53	336	8.30%
IEW2	Summerview 2 Wind Facility	Fort Macleod	53	336	8.61%
INT	Interlakes Hydro Facility	Seebe	44	376	3.50%
IOR1	Cold Lake Industrial System	Cold Lake	28	1303	(1.52%)
IOR3	Kearl Oil Sands Industrial System	Fort McMurray	25	1610	4.81%
IOR4	Strathcona Refinery Industrial System	Edmonton	60	30694066	1.22%
JNR1	Joss MPC WAGF (306S)	Empress	48	—	8.41%
JNR2	Joss Jenner WAGF - Phase 2 (306S)	Medicine Hat	4	—	8.53%
JNR3	Jenner Wind Phase 3 (306S)	Medicine Hat	4	—	8.44%
KAN	Kananaskis Hydro Facility	Seebe	44	193	0.00%
KH2	Keephills #2	Lake Wabamun	40	420	2.36%
KH3	Keephills #3	Lake Wabamun	40	510	1.81%
KHW1	Kettles Hill Wind Facility	Fort Macleod	53	402	7.87%
LAN1	Pattern Lanfine North Wind (601S)	Hanna	42	—	7.93%
LETH181SN	City of Lethbridge Reversing POD - Chinook (181S)	Lethbridge	54	3367	2.92%
MEG1	MEG Christina Lake Industrial System	Fort McMurray	25	405	1.13%
MKR1	Muskeg River Industrial System	Fort McMurray	25	1236	1.50%
MKRC	MacKay River Industrial System	Fort McMurray	25	1274	0.81%
NEP1	Ghost Pine Wind Facility	Hanna	42	603	7.43%
NOVAGEN15M	Joffre Industrial System	Red Deer	35	383	0.30%
NPP1	Northern Prairie Power Project	Grande Prairie	20	1118	(12.00%)
NRG3	NRGreen	Swan Hills	26	1674	(2.58%)
NX01	Nexen Balzac	Calgary	6	198	0.30%
NX02	Nexen Long Lake Industrial System	Fort McMurray	25	1241	0.65%
OMRH	Oldman River Hydro Facility	Fort Macleod	53	230	5.48%
OWF1	Oldman 2 Wind Facility	Fort Macleod	53	543	8.18%
PAW1	Paintearth Wind Power (973S)	Hanna	42	1418	7.21%
PH1	Poplar Hill #1	Grande Prairie	20	1118	(12.00%)
PMB1	West Pembina	Drayton Valley	30	4215	(8.94%)
POC	Pocaterra Hydro Facility	Seebe	44	329	2.65%
PR1	Primrose Industrial System	Cold Lake	28	800	(0.55%)
Proj_2137_2465	Enerfin Winnifred MPC Wind	Medicine Hat	4	—	12.00%
Proj_2195	FortisAlberta Reversing POD - Bassano (435S)	Brooks	47	399	5.34%
Proj_2421	RESC Big Sky Solar	Empress	48	549051	7.36%
Proj_2424	ATCO Electric Reversing POD - Oyen (767S)	Hanna	42	—	10.71%
Proj_2441	Halkirk Wind Facility 2	Alliance/Battle River	36	—	8.24%
Proj_2548	ATCOElectric Reversing POD - Irish Creek (706S)	Lloydminster	13	19377	2.70%
Proj_693	Wild Rose 2 Wind Farm (547S)	Medicine Hat	4	477	12.00%
RB5	Rainbow #5	Rainbow Lake	17	83	(6.24%)
RIV1	Riverview Wind Facility	Fort Macleod	53	69221	7.77%
RPT1	Jurassic Solar Facility*	Empress	48	—	2.92%
RPT2	Jurassic Energy Storage Facility*	Empress	48	—	2.92%
RTL1	Rattlesnake Ridge Wind Facility	Medicine Hat	4	—	12.00%
RUN	Rundle Hydro Facility	Seebe	44	195	(0.90%)
RYMD	Raymond Reservoir Hydro Facility	Glenwood	55	413	9.33%
S09N	ENMAX Reversing POD - 9 Substation (SS-9)	Calgary	6	4277	(3.84%)
S15N	ENMAX Reversing POD - 15 Substation (SS-15)*	Calgary	6	—	2.92%
S20N	ENMAX Reversing POD - 20 Substation (SS-20)*	Calgary	6	—	2.92%
S24N	ENMAX Reversing POD - 24 Substation (SS-24)	Calgary	6	—	1.69%
SCL1	Syncrude Industrial System	Fort McMurray	25	1200	3.87%
SCR1A/SCR1B	Suncor Industrial System	Fort McMurray	25	1200	1.18%
SCR2	Magrath Wind Facility	Glenwood	55	251	8.39%
SCR3	Chin Chute Wind Facility	Lethbridge	54	389	9.77%

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SCR4	Wintering Hills Wind Facility	Sheernes	43	759	12.00%
SCTG	Scotford Industrial System	Fort Saskatchewan	33	43	1.86%
SD6	Sundance #6	Lake Wabamun	40	135	0.63%
SDL1	Saddlebrook Solar and Storage	High River	46	557240	4.00%
SDL2	Saddlebrook Solar and Storage	High River	46	—	4.00%
SET1	South Edmonton Terminal	Edmonton	60	3436	1.02%
SH1	Sheerness #1	Sheernes	43	1481	4.03%
SH2	Sheerness #2	Sheernes	43	1486	3.95%
SHCG	Shell Caroline	Caroline	38	370	(1.58%)
SHH1	EDPR Sharp Hills Wind Farm (363S)	Hanna	42	831	6.82%
SLP1	Slave Lake Pulp	High Prairie	21	1230	(3.76%)
SLR1	Sollair Solar	Airdrie	57	549071	1.77%
SPR	Spray Hydro Facility	Seebe	44	310	(0.88%)
SUM1	Summerview Energy Storage Facility	Fort Macleod	53	336	2.92%
SWP1	Stirling WAGF Project (967S)	Empress	48	—	10.79%
TAB1	Taber Wind Facility	Vauxhall	52	343	10.71%
TAY1	Taylor Hydro Facility	Glenwood	55	693	7.11%
TC01	Carseland Industrial System	Strathmore	45	5251	3.01%
TC02	Redwater Industrial System	Fort Saskatchewan	33	50	0.29%
THS	Three Sisters Hydro Plant	Seebe	44	379	2.92%
TVS1	Travers Solar Facility	Stavely	49	—	6.61%
VVW1	Valleyview #1	Valleyview	23	1172	(5.87%)
VVW2	Valleyview #2	Valleyview	23	1172	(5.24%)
WCR1	BluEarth Wheatcrest MPC Solar	Vauxhall	52	549039	9.02%
WEY1	Weyerhaeuser	Grande Prairie	20	1140	(4.94%)
WHE1	Wheatland WAGF Project (981S)	Sheerness	43	—	12.00%
WHT1	Whitla Wind Facility	Medicine Hat	4	60990	12.00%
WHT2	Whitla Phase 2 Wind Facility	Medicine Hat	4	60990	12.00%
WRW1	Windrise Wind Facility	Fort Macleod	53	—	6.28%
WST1	Westlock Power Plant	Athabasca/Lac La Biche	27	14	(1.05%)
BCHEXP	Alberta-BC Interite - Export	WSCC	15	1520	1.08%
BCHIMP	Alberta-BC Interite - Import	WSCC	15	1520	3.31%
MTEXP	Alberta-Montana Intertie - Export	Glenwood	55	80000	—
120SIMP	Alberta-Montana Intertie - Import	Glenwood	55	80000	6.09%
SPCEXP	Alberta-Saskatchewan Intertie - Export	Empress	48	1473	2.34%
SPCIMP	Alberta-Saskatchewan Intertie - Import	Empress	48	1473	5.38%

(*) When 2024 loss factors were being determined, this location did not satisfy the project inclusion criteria in subsection 7 of section 501.10 of the ISO rules. The average annual loss factor for the transmission system has therefore been used for this location with subsequent annual shifting and compression, in accordance with subsections 9(2), 9(3), and 11 of section 501.10 of the ISO rules.