BC HYDRO

T&D SYSTEM OPERATIONS

OPERATING ORDER 5T–14

RATINGS FOR ALL TRANSMISSION AND DISTRIBUTION TRANSFORMERS

Supersedes 5T-14 issued 16 September 2022

Effective Date: 08 November 2022

Review Year: 2026

Original signed by
Amanuel Habte for:

APPROVED BY: _____

Martin Hon
Principal Engineer
T&D System Operations

Highlight Denotes Revision

- This SOO must be posted on bchydro.com.
- This SOO must be posted in the BCRC Extranet.
- This SOO requires email conveyance to reliability entities.

1.0 GENERAL

1.1 Intent and Scope

This operating order defines the operating limits of all transmission and distribution transformers. The continuous operating limit of each transformer branch is the minimum continuous current rating of the equipment in the transformer branch (e.g. circuit breaker, disconnect, bushing, bus, etc.).

Refer to Appendix 1 for ratings of all transmission and distribution transformers.

Note: Appendix 1 currently contains only distribution transformers.

1.2 Policy and Process

The review and update of 5T-14 is the responsibility of the T&D System Operations (TDSO) Director. Responsibility is delegated to the Operations (Ops) Planner for updating the order, and to the TDSO Principal Engineer for final sign-off. The Ops Planner will work with the PM (Project Manager) and/or Stations Asset Planning – Substation Growth and Sustainment (SAP-SGS) to ensure the rating is confirmed and updated in 5T-14.

All ratings are provided by SAP-SGS.

A Commissioning Notice to Energize (CNE) can be used to confirm ratings of new or updated transformers because it confirms that the technical specifications and operations requirements have been reviewed and accepted by a Professional of Record.

Subsequent to the revision of 5T-14, the following operating tools need to be updated:

- EMS alarms update: CPC and RTS SCADA teams are notified by distribution list when 5T-14 is updated. Analog alarm and warnings settings are updated accordingly.
- Other operating order update requirements: Ops Planner must confirm and remove ratings from other orders and cite the reference to 5T-14, and prepare for signing by the responsible BC Hydro Manager.

1.3 Normal Rated Capacity

The rating of a transmission or distribution transformer is dependent upon ambient temperature that is normally defined to be at 30°C ambient for summer and 0°C ambient for winter.

2.0 TRANSFORMER RATINGS

Transmission system transformers on the Bulk Electric System (BES) are rated on an individual basis.

Transformer emergency ratings at BC Hydro are established with the following methods:

- Application of Standard IEEE C57.91-2011, Guide for Loading Mineral-Oil Immersed Transformers and Step-Voltage Regulators. This guide is applicable to loading 65°C mineral-oil-immersed distribution and power transformers. Guides for loading, IEEE Std C57.91-1981 (prior edition), IEEE Std C57.92™-1981, and IEEE Std C57.115-1991 (redesignated as IEEE Std 756) are all combined in this document as the basic theory of transformer loading is the same, whether the subject is distribution transformers, power transformers 100 MVA and smaller, or transformers larger than 100 MVA. In recognition of different types of construction, special considerations, and the degree of conservatism involved in the loading of this equipment, specific sections are devoted to power transformers and distribution transformers. In the previously referenced information, the guide for units larger than 100 MVA referenced the IEEE Std C57.92-1981 loading guide for units up to and including 100 MVA.

- Limitations of the transformer bushings as established and evaluated by the original bushing manufacturer or by bushing nameplate rating. BC Hydro's specifications require that the bushings are not the limiting factor to load a transformer.
- Limitations of the loading capability of on-load tap changers and de-energized tap changers (if applicable).

Transmission Stations – Transformer Loading

For transmission system substations, the transformers do not see the same varying magnitudes of intra-day load variation as distribution transformers experience. Therefore, in accordance with IEEE and CSA standards, the maximum winter loading limit will be the fully forced cooling rating plus **0.75% per degree Celsius** that the ambient temperature is below **25°C.** Historically, the temperature based overload capacity has only been taken to a temperature of **0°C**, and this practice will remain used as a planning limit.

Conclusion: For system transformers, the winter loading limit will be taken as **118.75%** of the fully forced cooling rating. The summer loading limit will be taken as the fully forced cooling rating. In the situation when a system transformer is expected to carry load higher than 1.0 p.u. of the fully forced cooling rating in the winter time (0°C), a real time analysis is required.

3.0 TRANSFORMER RATING TABLES

Transformers shown in the rating table in Appendix 1 may be the LIMITING factors for the branch.

Note: Branch limitations have not been populated yet. In the future, the limiting factor in the transformer branch will be listed in the Limiting factor column..

Transmission system transformers that have been de-rated due to Facility Rating Calculation are listed in Appendix 2.

Abbreviations and Definitions Used in Transformer Rating Tables:

DS/D	Disconnect Switch
CT	Current Transformer
CB	Circuit Breaker
HV	Primary Winding Side (High Voltage side)
LV	Secondary Winding Side (Low Voltage side)

4.0 REVISION HISTORY

Revised By	Revision Date	Summary of Revision
AH	22 February 2021	Appendix 3 – updated SEL transformer ratings.
AH	29 April 2021	Appendix 3 – updated DMR ratings, and added DMR Notes at the end of table.
AH	18 June 2021	Appendix 3 – updated BR1 ratings, and added applicable Note #10.
MDW/MH	30 August 2021	Appendix 1 – removed FST T1 (station de-commissioned); updated NOR T2 ratings.
MDW	06 December 2021	Appendix 1 – changed MT2 to MTE.
AH	13 September 2022	Appendix 1 – Added MLE T3 transformer ratings and Appendix 3 – Added HMH T1 and T3 transformer ratings .
AH	08 November 2022	Appendix 3 – Updated BRT T4 transformer ratings

APPENDIX 1 - Ratings of Distribution Transformers

Substation	Transformer	Transformer Rating	Transformer Capacity at 30°C (MVA)	Transformer Capacity at 0°C (MVA)	Station Equipment Limitations
AFT	T1	60/25kV, 12.5MVA	14	15	
ALZ	T1	230/25kV, 75MVA	79	100	
	T4	230/25kV, 84MVA	87	100	
	T5	60/25kV, 46.6MVA	49	55	
	T6	60/25kV, 46.6MVA	49	55	
ANN	T1	60/12kV, 46.6MVA	48	55	
	T2	60/12kV, 46.6MVA	48	62	
	T3	60/12kV, 46.6MVA	48	55	
ARM	T1	138/25kV, 25MVA	28	33	
	T2	138/25kV, 25MVA	28	33	
ARN	T11	230/25kV, 150MVA	158	200	
	T12	230/25kV, 150MVA	158	200	
ATH	T1	138/25kV, 50MVA	52	67	
	T2	138/25kV, 50MVA	52	67	
AVO	T1	138/12kV, 2MVA	2	2.4	
	T2	12/25kV, 0.3 MVA	0.3	0.3	
AYH	T1	138/25kV, 11.25 MVA	11.25	12	
BAB	T1	138/25kV, 16.7 MVA	16.7	20	
BAL	T1	60/12kV, 20MVA	21	26	
	T2	60/12kV, 20MVA	21	26	
BAR	T1	138/25kV, 16.6MVA	18.8	23.2	
BBR	T1	60/25kV, 12.5MVA	13	15	
BBS	T1	60/12kV, 75MVA	79	100	
	T2	60/12kV, 75MVA	79	100	
BKB	T1	138/25kV, 75 MVA	84	100	
	T2	138/25kV, 75 MVA	84	100	
BKL	T1	138/25kV, 50 MVA	52.0	66.3	
	T3	138/25kV, 50 MVA	52.0	66.3	
BLU	T1	138/25kV, 16.6 MVA	17.4	21.2	
BND	T1	230/12kV, 150MVA	177	214	
	T2	230/12kV, 150MVA	177	214	
BR1	T14	12.6/12.6kV, 2MVA	2.0	2.2	
BRN	T1	138/25kV, 28MVA	28.00	33.3	
	T2	138/25kV, 25MVA	26.20	33.3	
BTA	T1	60/25kV, 12.5MVA	12.5	15	
BVY	T10	66/25kV, 41.6MVA	43.70	55.3	
	T11	66/25kV, 41.6MVA	43.70	55.3	
CAM	T2	230/25kV, 150MVA	158	200	
	T3	230/25kV, 84MVA	87	100	
	T4	230/25kV, 84MVA	87	100	
CAP	T1	60/12kV, 41.6MVA	43.68	55.33	
	T2	60/12kV, 41.6MVA	43.68	55.33	

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Substation	Transformer	Transformer Rating	Transformer Capacity at 30°C (MVA)	Transformer Capacity at 0°C (MVA)	Station Equipment Limitations
CBL	T1	138/25kV, 84MVA	77.25	94.5	
	T2	138/25kV, 84MVA	77.25	94.5	
	T3	138/25kV, 75MVA	81	99.38	
CBN	T3	230/25kV, 150MVA	158	200	
	T4	230/25kV, 150MVA	158	200	
CHF	T10	66/25kV, 41.6MVA	43.70	55.3	
	T11	66/25kV, 41.6MVA	43.70	55.3	
CHK	T1	60/25kV, 41.7MVA	44	56	
	T2	60/25kV, 41.7MVA	44	56	
CHS	T2	138/25kV, 16.6MVA	18.8	22.1	
CKY	T8	60/25kV, 8.4MVA	8.82	11.17	
	T9	60/25kV, 25MVA	26.25	33.25	
CLB	T1	66/25kV, 5MVA	5.60	6.7	
CLD	T1	138/25kV, 75MVA	78.75	100	
	T2	138/25kV, 84MVA	78.75	100	
	T3	138/25kV, 84MVA	78.75	100	
CLN	T1	60/25kV, 12.5MVA	13.1	16	
CLW	T1	138/25kV, 25 MVA	28.0	30	
CMS	T3	230/25 kV, 3 x 1.5 MVA	4.5	5.4	
CMX	T1	138/25kV, 75MVA	78.8	93.9	
	T2	138/25kV, 75MVA	78.8	93.9	
CNL	T1	60/12kV, 3.75 MVA	3.8	4.5	
COK	T1	230/25kV, 150MVA	158	200	
	T3	230/25kV, 150MVA	158	200	
	T4	230/25kV, 84MVA	88	112	
	T5	230/25kV, 84MVA	88	112	
CQM	T1	60/12kV, 41.6MVA	44	44	
	T3	60/12kV, 41.6MVA	44	44	
CSN	T2	230/12kV, 75MVA	79	100	
	T3	230/12kV, 75MVA	79	100	
	T4	230/66kV, 75 MVA	75	89	
	T5	230/66kV, 75 MVA	75	89	
CSQ	T1	230/12kV, 150MVA	158	200	
	T2	230/12kV, 150MVA	158	200	
	T3	230/12kV, 150MVA	158	200	
CWD	T1	138/25kV, 50MVA	52.50	66.5	
	T2	138/25kV, 50MVA	52.50	66.5	
DAW	T1	138/25kV, 56MVA	56.00	66.5	
	T2	138/25kV, 56MVA	56.00	66.5	
	T3	138/25kV, 75MVA	78.75	100	
DCV	T1	60/12kV, 46.5MVA	49.7	61.85	
	T3	60/12kV, 46.5MVA	49.7	61.85	

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Substation	Transformer	Transformer Rating	Transformer Capacity at 30°C (MVA)	Transformer Capacity at 0°C (MVA)	Station Equipment Limitations
DGR	T1	60/12kV, 84MVA	88	112	
	T2	60/12kV, 84MVA	88	112	
	T3	60/12kV, 84MVA	88	112	
	T4	60/12kV, 84MVA	88	112	
DIL	T1	66/7.2kV, 0.2MVA	0.20	0.24	
DUG	T1	138/25kV, 84 MVA	80.0	87.3	
	T3	138/25kV, 84 MVA	88.2	107.2	
	T4	138/25kV, 84 MVA	80.0	87.3	
EFD	T1	138/25kV, 16.6MVA	18.6	22.1	
	T2	138/25kV, 10MVA	12.9	15	
END	T1	138/25kV, 10MVA	10.6	13.3	
	T2	138V/25kV, 25MVA	25.0	30	
ESQ	T2	230/12kV, 150MVA	157.5	200	
	T13	230/12kV, 168MVA	168	200	
FCN	T1	230/25kV, 75MVA	78.75	99.75	
	T2	230/25kV, 75MVA	78.75	99.75	
FHS	T1	66/25kV, 46.8MVA	46.80	55.30	
	T2	66/25kV, 40MVA	42.00	53.20	
FJN	T1	138/25kV, 75MVA	78.75	100	
	T2	138/25kV, 56MVA	56.00	66.5	
	T3	138/25kV, 56MVA	56.00	66.5	
FLW	T1	230/25kV, 150MVA	158	200	
	T2	230/25kV, 150MVA	158	200	
FM2	T1	66/25kV, 13.75MVA	13.75	16.6	
	T2	66/25kV, 28MVA	28.00	33.3	
FMT (12 kV)	T1	60/12kV, 4 MVA	4.0	4.8	
FMT (25 kV)	T2	60/12kV, 12.5MVA	12.5	15	
FNE	T1	60/25kV, 25MVA	25.0	30	
	T2	60/25kV, 25MVA	26.2	33.3	
FOX	T1	138/25kV, 25MVA	26.30	33.3	
	T2	138/25kV, 25MVA	26.30	33.3	
FRC	T1	60/25kV, 2.67MVA	2.67	3.2	
FSR	T1	66/25kV, 14MVA	14	15	
FVW	T1	138/25kV, 28MVA	28	33.25	
	T2	138/25kV, 25MVA	26.25	33.25	
GDK	T1	60/4kV, 25MVA	26	33	
	T2	60/4kV, 25MVA	26	33	
GDN	T1	60/25kV, 25MVA	26.2	33.3	
	T3	60/25kV, 25MVA	26.2	33.3	
GIB	T1	138/25kV, 28MVA	28	33.25	
	T2	138/25kV, 25MVA	26.25	33.25	
GLD	T2	138/25kV, 10MVA	10.5	13.3	
	T3	138/25kV, 10MVA	10.5	13.3	

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Substation	Transformer	Transformer Rating	Transformer Capacity at 30°C (MVA)	Transformer Capacity at 0°C (MVA)	Station Equipment Limitations
GLR	T1	60/4kV, 20MVA	21	26	
	T2	60/4kV, 20MVA	21	26	
GLS	T1	138/25kV, 28MVA	28	33.6	
GLT	T1	60/25kV 25MVA	25	30	
GOW	T5	230/25kV, 75MVA	78.75	100	
	T6	230/25kV, 75MVA	78.75	100	
GPT	T1	138/12kV, 28MVA	29.4	37.24	
	T2	138/25kV, 28MVA	29.4	37.24	
	T54	25/12 kV, 25MVA	26.25	33.25	
GRR	T1	66/2.4kV, 0.08MVA	0.08	0.09	
GTP	T11	138/25kV, 84MVA	78.75	100	
	T12	138/25kV, 84MVA	78.75	100	
	T13	138/25kV, 75MVA	78.75	100	
GVL	T1	66/25kV, 12.5MVA	12.5	15	
HCT	T1	60/12kV, 28MVA	28	33.25	
	T2	60/12kV, 28MVA	28	33.25	
HFY	T1	138/25kV, 16.6MVA	16.9	20.7	
	T2	138/25kV, 25MVA	25	33.3	
HLD	T2	60/25kV, 5MVA	5	5	
HMH	T5	60/25kV, 41.6MVA	43.7	55.2	
	T6	60/25kV, 41.6MVA	43.7	55.2	
HNY	T1	60/25kV, 75MVA	79	96	
	T3	60/25kV, 75MVA	79	100	
HOP	T11	60/25kV, 14MVA	15	18	
	T12	60/25kV, 14MVA	15	18	
HPN	T4	230/12kV, 84MVA	88	112	
	T5	230/12kV, 84MVA	88	112	
	T6	230/12kV, 84MVA	88	112	
HPN 25	T7	230/25kV, 150MVA	158	200	
	T8	230/25kV, 150MVA	158	200	
HRD	T1	60/25kV, 75MVA	79	100	
	T2	60/25kV, 75MVA	79	100	
HSB	T1	60/12kV, 25MVA	26.25	33.25	
	T2	60/12kV, 25MVA	26.25	33.25	
HSY	T1	230/25kV, 150MVA	157.5	200	
	T2	230/25kV, 150MVA	157.5	200	
	T11	230/12kV, 150MVA	157.5	200	
	T12	230/12kV, 168MVA	168	200	
HUS	T2	138/25kV, 18.7MVA	18.7	22.1	
	T3	138/25kV, 18.8MVA	18.8	22	
HWD	T1	138/25 kV, 84MVA	80	87.3	
	T2	138/25kV, 75MVA	78.8	87.3	
HZN	T1	138/25kV, 18.8MVA	18.8	22.1	
	T2	138/25kV, 28MVA	28	33.3	

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Substation	Transformer	Transformer Rating	Transformer Capacity at 30°C (MVA)	Transformer Capacity at 0°C (MVA)	Station Equipment Limitations
ILL	T1	230/25kV, 25MVA	27.4	33.8	
	T2	230/25kV, 25MVA	27.4	33.8	
INV	T4	60/25kV, 12.5MVA	13.7	15	
IPR	T1	66/25kV, 12.5MVA	10	12	
JLN	T1	60/12kV, 50MVA	52.5	66.5	
	T2	60/12kV, 46.5MVA	46.5	55.33	
JOE	T1	60/25kV, 12.5MVA	13.7	17.5	
	T2	60/25kV, 12.5MVA	13.7	17.5	
JOR	T1	138/25kV, 25MVA	26.3	33.3	
	T2	138/25kV, 25MVA	26.3	33.3	
KAL	T1	66/25kV, 28MVA	28	33.3	
	T2	66/25kV, 28MVA	28	33.3	
KDS	T5	138/25kV, 18.8MVA	17.4	22	
KEN	T1	60/12kV, 20MVA	21	26	
	T2	60/12kV, 20MVA	21	26	
KGH	T4	138/25kV, 28MVA	28	33.6	
KI1	T7	60/12kV, 75MVA	79	100	
	T8	60/12kV, 75MVA	79	100	
KI1 4	T5	60/4kV, 25MVA	26	33	
	T6	60/4kV, 25MVA	26	33	
KI2	T4	230/25kV, 150MVA	158	200	
	T5	230/25kV, 150MVA	158	200	
KSH	T2	138/25kV, 75MVA	78.8	94	
	T3	138/25kV, 75MVA	78.8	94	
KTG	T1	230/25kV, 75MVA	78.8	94.5	
	T2	230/25kV, 75MVA	78.8	94.5	
LAJ	T2	60/12kV, 3.75MVA	3.8	4.5	
LB1	T3	60/2.3kV, 0.75MVA	0.8	1	
LBH	T11	60/25kV, 50MVA	52.5	66.5	
	T12	60/25kV, 50MVA	52.5	66.5	
LBY	T1	60/12kV, 12.5MVA	12.5	15	
LCW	T1	69/25kV, 25MVA	25	32.8	
	T2	69/25kV, 28MVA	28	33.25	
LDY	T1	138/25kV, 50MVA	50	59.5	
	T2	138/25kV, 56MVA	52.75	65.15	
LOH	T1	60/12kV, 41.6MVA	44	55	
	T3	60/12kV, 41.6MVA	44	55	
LTZ	T1	138/25kV, 75MVA	78.8	100	
	T2	138/25kV, 75MVA	78.8	100	
LU2	T1	138/25kV, 25MVA	27.2	33.5	
	T2	138/25kV, 25MVA	27.5	33.7	
LYN	T1	230/12kV, 75MVA	78.75	99.75	
	T2	230/12kV, 75MVA	78.75	99.75	

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Substation	Transformer	Transformer Rating	Transformer Capacity at 30°C (MVA)	Transformer Capacity at 0°C (MVA)	Station Equipment Limitations
MAN	T1	230/12kV, 84MVA	88	112	
	T2	230/12kV, 84MVA	88	112	
	T3	230/12kV, 75MVA	79	100	
MCA	T11	60/12kV, 10MVA	10	12	
MCK	T1	60/25kV, 0.2MVA	0.2	0.2	
MEZ	T1	138/25kV, 28MVA	2	2.4	
MFE	T1	138/25kV, 18.6MVA	16.6	20	
MGT	T1	66/25kV, 6.67MVA	5	6	
MIN	T2	287/25kV, 50MVA	52.5	66.5	
	T3	287/25kV, 50MVA	52.5	66.5	
MIS	T1	60/25kV, 75MVA	79	100	
	T2	60/25kV, 75MVA	79	100	
MLE	T1	230/25kV, 75MVA	79	100	
	T2	230/25kV, 75MVA	79	100	
	T3	230/25kV, 75MVA	79	100	
MLN	T2	230/25kV, 150MVA	158	200	
	T3	230/25kV, 150MVA	158	200	
MON	T1	138/12kV, 25MVA	28	33.3	
	T2	138/12kV, 8MVA	8	9.6	
MPT	T1	230/12kV, 150MVA	158	200	
	T2	230/12kV, 150MVA	158	200	
MR2	T1	138/25kV, 75MVA	75	100	
	T3	138/25kV, 75MVA	75	100	
MRG	T11	60/25kV, 41.6MVA	44	55	
	T12	60/25kV, 41.6MVA	44	55	
	T13	60/25kV, 41.6MVA	44	55	
MTE	T1	138/25kV, 12.5MVA	12.5	15	
MUR	T3	230/12kV, 84MVA	88	112	
	T5	230/12kV, 84MVA	88	112	
	T7	230/12kV, 84MVA	88	112	
MVL	T1	60/25kV, 14MVA	13.8	16.8	
	T2	60/25kV, 25MVA	25	30	
MWN	T1	138/25kV, 14MVA	12.5	15	
MYE	T1	60/12kV, 5MVA	5.0	6.0	
NAK	T1	138/12kV, 5MVA	3.9	5.5	
	T2	138/12kV, 5MVA	3.9	5.5	
NDR	T1	138/12kV, 5MVA	5.6	6.7	
	T2	138/12kV, 4MVA	4	4.8	
NEL	T1	230/12kV, 75MVA	79	100	
	T2	230/12kV, 150MVA	158	200	
	T3	230/12kV, 150MVA	158	200	
NFD	T1	138/25 kV, 56MVA	50	61	
	T2	138/25kV, 56MVA	50	61	
	T3	138/25kV, 56MVA	50	61	

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Substation	Transformer	Transformer Rating	Transformer Capacity at 30°C (MVA)	Transformer Capacity at 0°C (MVA)	Station Equipment Limitations
NKL	T1	60/25kV, 75MVA	79	100	
	T2	60/25kV, 41.7MVA	44	56	
	T3	60/25kV, 41.7MVA	44	56	
NOR	T1	60/12kV, 20MVA	21	26.6	
	T2	60/12kV, 41.66MVA	43	55	
	T3	60/12kV, 20MVA	21	26.6	
NVR	T1	60/12kV, 50MVA	52.5	66.5	
	T2	60/12kV, 50MVA	52.5	66.5	
NWR	T1	60/12kV, 25MVA	26	33	
	T2	60/12kV, 50MVA	53	67	
	T3	60/12kV, 50MVA	53	67	
OFD 12	T1	66/12kV, 28MVA	28	33.3	
	T2	66/12kV, 22.4MVA	22.4	26.6	
OFD 25	T3	66/25kV, 41.6MVA	43.6	55.3	
	T4	66/25kV, 41.6MVA	43.6	55.3	
OYR	T1	138/25kV, 41.7MVA	45.1	53.5	
	T2	138/25kV, 50MVA	52.5	66.5	
PAL	T11	138/25kV, 84MVA	78.8	99.15	
	T12	138/25kV, 84MVA	78.8	99.15	
PAV	T1	60/12kV, 0.5MVA	0.4	0.4	
PCA	T1	66/12kV, 46.7MVA	46.7	55.3	
	T2	66/12kV, 46.7MVA	46.7	55.3	
	T3	66/12kV, 46.7MVA	46.7	55.3	
PED	T1	66/25kV, 10MVA	10	12	
PEM	T1	230/25kV, 16.8MVA	18.8	22.5	
	T2	230/25kV, 16.8MVA	18.8	22.5	
PHR	T1	138/25 kV, 28MVA	28	33.25	
	T3	138/25kV, 16.6MVA	17.43	22.08	
PHY	T1	138/25kV, 28MVA	25	30	
	T2	138/25kV, 28MVA	25	30	
PKL	T1	60/25kV, 75MVA	79	100	
	T2	60/25kV, 75MVA	79	100	
PML	T1	138/25kV, 28MVA	28	33.25	
	T2	138/25kV, 25MVA	27	32.9	
PPS	T1	66/25kV, 13.3MVA	14	17.7	
	T2	66/25kV, 13.3MVA	14	17.7	
PSN	T1	60/12kV, 12.5MVA	12.5	15	
PTO	T1	60/12kV, 0.2MVA	0.2	0.24	
PUN	T3	138/25kV, 56MVA	50	61.1	
	T4	138/25kV, 56MVA	52.5	66.5	
PVL	T1	138/25kV, 75MVA	78.8	95.2	
	T2	138/25kV, 84MVA	80.6	98.33	
PVO	T3	138/25kV, 56MVA	59	72.5	
	T4	138/25kV, 56MVA	59	72.5	

APPENDIX 1 - Ratings of Distribution Transformers

Substation	Transformer	Transformer Rating	Transformer Capacity at 30°C (MVA)	Transformer Capacity at 0°C (MVA)	Station Equipment Limitations
PVW	T1	66/25kV, 41.6MVA	43.8	52.4	
	T2	66/25kV, 28MVA	26.2	32.2	
QLC	T1	138/25kV, 41.7MVA	45.1	55.46	
	T2	138/25kV, 46MVA	48.3	61.18	
QNL	T1	66/12kV, 27.5MVA	27.5	33.3	
	T2	66/12kV, 22MVA	22	26.6	
	T3	66/12kV, 22MVA	22	26.6	
RBF	T1	66/25kV, 84MVA	79	100	
	T2	66/25kV, 84MVA	79	100	
RBW	T1	230/25kV, 75MVA	78.75	99.75	
	T2	230/25kV, 75MVA	78.75	99.75	
RDM	T1	60/25kV, 12.5MVA	13.7	16.8	
REV	T9	25.2/12.6kV, 12.5MVA	12.5	14.8	
RIM	T1	60/12kV, 84MVA	87	100	
	T3	60/12kV, 84MVA	87	100	
RO2	T1	60/12kV, 41.6MVA	44	55	
	T2	60/12kV, 41.6MVA	44	55	
SAC	T1	208/14.4kV, 4MVA	4	4.8	
SAL	T1	138/25kV, 50MVA	53.5	63.6	
	T2	138/25kV, 50MVA	53.5	63.6	
SAM	T1	138/25kV, 56MVA	53	65.6	
	T3	138/25kV, 56MVA	53	65.6	
SBR	T1	60/25kV, 13.3MVA	13.3	16	
SCM	T1	60/25kV, 10MVA	11.3	13.9	
	T2	60/25kV, 25MVA	28.3	33.6	
SCT	T1	60/12kV, 28MVA	29	36	
	T2	60/12kV, 46MVA	48	61	
SEA	T1	60/12kV, 25MVA	26	33	
	T2	60/12kV, 25MVA	26	33	
SEC	T1	138/25kV, 75MVA	78.75	99.75	
	T2	138/25kV, 75MVA	78.75	99.75	
SHA	T1	138/25kV, 75MVA	75	99	
	T2	138/25kV, 75MVA	75	99	
SKU	T1	60/12kV, 5MVA	5	6	
SMH	T1	60/25kV, 8.4MVA	8.8	10	
	T2	60/25kV, 25MVA	25	30	
SMW	T1	60/25kV, 41.6MVA	44	55	
	T2	60/25kV, 41.6MVA	44	55	
SNY	T1	69/25kV, 73MVA	73.8	87.5	
	T2	69/25kV, 73MVA	73.8	87.5	
SON	T2	60/12kV, 20MVA	22.4	26.9	
	T3	60/12kV, 20MVA	21	26.6	
SOO	T1	138/25kV, 50MVA	52.5	66.5	
	T2	138/25kV, 56MVA	56	66.5	
SPD	T1	60/25kV, 12.5MVA	14	16.8	
SPG	T12	230/12kV, 168MVA	177	214	
	T13	230/12kV, 168MVA	177	214	

APPENDIX 1 - Ratings of Distribution Transformers

Substation	Transformer	Transformer Rating	Transformer Capacity at 30°C (MVA)	Transformer Capacity at 0°C (MVA)	Station Equipment Limitations
SPL	T1	60/25kV, 41.7MVA	44.3	44.3	
	T2	60/25kV, 41.7MVA	43.8	53.5	
SPN	T1	12/4kV, 2.5MVA	2.5	3	
SQH	T1	60/25kV, 22MVA	22	26	
	T2	60/25kV, 20MVA	21	26	
	T3	60/25kV, 41.6MVA	43.68	55.33	
SRS	T1	138/25kV, 28MVA	28.0	33.25	
	T2	138/25kV, 28MVA	28.0	33.25	
	T3	138/25kV, 25MVA	26.25	33.25	
SRY	T1	60/12kV, 20MVA	21	26	
	T2	60/12kV, 20MVA	21	26	
STO	T1	138/25kV, 50MVA	52.5	52.5	
	T2	138/25kV, 25MVA	28.5	34.8	
STV	T2	230/25kV, 84MVA	94	109	
	T3	230/25kV, 84MVA	94	109	
STW	T3	138/25kV, 16.6MVA	16.6	20	
SVA	T5	138/25kV, 10MVA	10	12.6	
SVD	T1	60/25kV, 75MVA	79	100	
	T2	60/25kV, 75MVA	79	100	
SWN	T1	138/25kV, 75MVA	84	100	
	T2	138/25kV, 75MVA	84	100	
SYH	T1	230/25kV, 84MVA	87	112	
	T2	230/25kV, 84MVA	87	112	
	T3	230/25kV, 84MVA	87	112	
SZM	T1	60/12kV, 0.75MVA	0.75	0.9	
TAT	T1	287/25kV, 16.6MVA	16.6	16.6	
TER	T1	66/25kV, 22.4MVA	22.4	26.6	
	T2	66/25kV, 27.5MVA	28	33	
TLR	T1	230/25kV, 75MVA	78.8	100	
	T2	230/25kV, 75MVA	78.8	100	
TSV	T1	138/25kV, 14MVA	14	16.6	
	T2	138/25kV, 11.25MVA	11.81	14.96	
TSW	T1	60/25kV, 46.6MVA	47	56	
	T2	60/25kV, 46.6MVA	47	56	
TXL	T1	60/25kV, 0.6MVA	0.6	0.6	
UFR	T1	66/25kV, 14MVA	14	15	
UHT	T1	208/14.4kV, 4MVA	4	4.8	
VBY	T1	138/25kV, 25MVA	28	33.6	
VDF	T2	66/25kV, 28MVA	28	33	
	T3	66/25kV, 50MVA	52.5	66.5	
VLM	T3	138/25kV, 16.6MVA	16.7	20	
VNT	T4	138/25kV, 50MVA	57.8	71	
	T5	138/25kV, 50MVA	57.8	71	
	T6	138/25kV, 75MVA	80.6	98.3	
WAH	T3	60/25kV, 25MVA	26	33	
	T4	60/25kV, 25MVA	26	33	
WAR	T1	60/12kV, 2.5MVA	2.5	3	

APPENDIX 1 - Ratings of Distribution Transformers

Substation	Transformer	Transformer Rating	Transformer Capacity at 30°C (MVA)	Transformer Capacity at 0°C (MVA)	Station Equipment Limitations
WBK	T1	138/25kV, 50MVA	56.8	66.5	
	T2	138/25kV, 25MVA	27.5	32.0	
	T3	138/25kV, 50MVA	55	55	
WHY	T2	230/25kV, 150MVA	158	200	
	T3	230/25kV, 150MVA	158	200	
WIN	T4	60/25kV, 25MVA	26.4	33.3	
WKA	T1	138/25kV, 75MVA	75	100	
	T2	138/25kV, 75MVA	75	100	
WLM 25	T1	66/25kV, 50MVA	52.5	66.5	
	T2	66/25kV, 46.6MVA	43.7	55.3	
	T3	66/25kV, 41.7MVA	43.79	55.5	
WOS	T1	138/12kV, 8MVA	8	9.6	
WRK	T11	60/25kV, 75MVA	79	100	
	T12	60/25kV, 75MVA	79	100	
WSP	T1	144/25kV, 41.7MVA	41.7	50.0	
	T2	144/25kV, 41.7MVA	41.7	50.0	
WWD	T1	60 kV/25kV, 5MVA	5.6	6.0	

APPENDIX 2 - Transmission System Transformer De-Rating Due to Facility Ratings Calculation

Substation	Transformer	Vrated HV Winding	Vrated LV Winding	Rated MVA (Note dual MVA is 55˚C//65˚C Temp. Rise)	Summer Normal 30˚C Ambient			Summer Emergency 30˚C Ambient 24 hours			Winter Normal 0˚C Ambient			Winter Emergency 0˚C Ambient 24 hours			Comment
					MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	
ACK	T2	512.5	242	1200	1200	1352	2863				1257	1417	3000				
	T3	512.5	242	1200	1200	1352	2863				1257	1417	3000				
GMS	T11	500	138	83.3//95	285	329	1192				287	331	1200				
	T12	500	138	83.3//95	285	329	1192				287	331	1200				
JOR	T1	138	13.2	100	91	383	4000				91	383	4000				
	T2	138	13.2	100	91	383	4000				91	383	4000				
NIC	T5	230	138	300	287	720	1200				287	720	1200				
	T6	230	138	300	287	720	1200				287	720	1200				
SLS	T1	230	138	150	134		559				143		600				Limited by 1L349
WSN	T2	512.5	242	1200	549		1310	671	756	1600	640		1528	671	756	1600	

Current to MVA conversion is based on transformer's rated voltage.

APPENDIX 3 - Transmission Transformer Equipment Rating

Substation	Tx	Vrated HV Winding	Vrated LV Winding	Rated MVA (Note dual MVA is 55˚C//65˚C Temp. Rise)	Summer Normal 30˚C Ambient			Summer Emergency 30˚C Ambient						Winter Normal 0˚C Ambient			Winter Emergent 0˚C Ambient					
								30 min.			8 hours						30 min.			8 hours		
					MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)
ACK	T2	512.5	242	3 x 400	De-rated. Please refer to Appendix 2.																	
ACK	T3	512.5	242	3 x 400	De-rated. Please refer to Appendix 2.																	
BMT	T1	230	138	150	150	377	628	270	678	1130	190	477	795	178	447	745	300	753	1255	223	560	933
BMT	T2	230	138	150	150	377	628	270	678	1130	190	477	795	178	447	745	300	753	1255	223	560	933
BMT	T3	230	138	150	150	377	628	270	678	1130	190	477	795	178	447	745	300	753	1255	223	560	933
BR1	T3	230	64.5	75	75	188	671	89	224	800	89	224	800	89	224	800	89	224	800	89	224	800
BR1	T30	230	64	84	84	211	758	84	211	758	84	211	758	100	251	902	100	251	902	100	251	902
BRT	T4	345	238	450	450	753	1092	704	1179	1428	536	897	1300	534	894	1296	846	1416	1713	637	1066	1545
CBK	T2	512.5	242	3 x 200	600	676	1431	600	676	1431	600	676	1431	714	804	1703	714	804	1703	714	804	1703
CBK	T3	512.5	242	3 x 200	600	676	1431	600	676	1431	600	676	1431	714	804	1703	714	804	1703	714	804	1703
CBN	T1	512.5	242	500	500	563	1193	500	563	1193	500	563	1193	594	669	1417	594	669	1417	594	669	1417
CBN	T2	512.5	242	500	500	563	1193	500	563	1193	500	563	1193	594	669	1417	594	669	1417	594	669	1417
CKY	T4	230	138	150//168	168	422	703	168	422	703	168	422	703	200	502	837	200	502	837	200	502	837
DMR	T1	512.5	242	3 x 400	1200	1352	2863	1560	1757	3722	1332	1501	3178	1425	1605	3400	1677	1889	4000	1608	1811	3836
DMR	T2	512.5	242	3 x 400	1200	1352	2863	1560	1757	3722	1332	1501	3178	1425	1605	3400	1677	1889	4000	1608	1811	3836
DMR	T4	230	138	150//168	168	422	703	168	422	703	168	422	703	200	502	837	200	502	837	200	502	837
DMR	T5	230	138	300	300	753	1255	300	753	1255	300	753	1255	356	894	1489	356	894	1489	356	894	1489
DMR	T6	230	138	300	300	753	1255	300	753	1255	300	753	1255	356	894	1489	356	894	1489	356	894	1489
DMR	T7	230	138	150//168	168	422	703	168	422	703	168	422	703	200	502	837	200	502	837	200	502	837
GLD	T1	230	138	168	168	422	703	168	422	703	168	422	703	200	502	837	200	502	837	200	502	837
GLD	T4	230	138	168	168	422	703	168	422	703	168	422	703	200	502	837	200	502	837	200	502	837
GLN	T5	230	137	150//168	168	422	708	168	422	708	168	422	708	200	502	843	200	502	843	200	502	843
GLN	T11	230	138	150	150	377	628	150	377	628	150	377	628	178	447	745	178	447	745	178	447	745
GLN	T1	512.5	242	3 x 200	600	676	1431	600	676	1431	600	676	1431	714	804	1703	714	804	1703	714	804	1703
GLN	T2	512.5	242	3 x 200	600	676	1431	600	676	1431	600	676	1431	714	804	1703	714	804	1703	714	804	1703
GMS	T11	500	138	3 x 83.3//95	De-rated. Please refer to Appendix 2.																	
GMS	T12	500	138	3 x 83.3//95	De-rated. Please refer to Appendix 2.																	
GMS	T13	512.5	242	3 x 100	300	338	716	300	338	716	300	338	716	356	401	849	356	401	849	356	401	849
GMS	T14	512.5	242	3 x 100	300	338	716	300	338	716	300	338	716	356	401	849	356	401	849	356	401	849

APPENDIX 3 - Transmission Transformer Equipment Rating

Substation	Tx	Vrated HV Winding	Vrated LV Winding	Rated MVA (Note dual MVA is 55˚C//65˚C Temp. Rise)	Summer Normal 30˚C Ambient			Summer Emergency 30˚C Ambient						Winter Normal 0˚C Ambient			Winter Emergent 0˚C Ambient					
								30 min.			8 hours						30 min.			8 hours		
					MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)
GTP	T14	230	138	150	150	377	628	277	695	1159	193	484	807	178	447	745	300	753	1255	226	567	946
HMH	T1	230	64.5	75	75	188	671	134	336	1199	92	230	822	89	224	798	134	336	1199	115	287	1025
HMH	T3	230	64.5	75	75	188	671	134	336	1199	92	230	822	89	224	798	134	336	1199	115	287	1025
HWW	T1	230	138	400	400	1004	1674	400	1004	1674	400	1004	1674	475	1192	1987	475	1192	1987	475	1192	1987
HWW	T2	230	138	400	400	1004	1674	400	1004	1674	400	1004	1674	475	1192	1987	475	1192	1987	475	1192	1987
ING	T2	512.5	242	3 x 400	1200	1352	2863	1200	1352	2863	1200	1352	2863	1425	1605	3400	1425	1605	3400	1425	1605	3400
ING	T4	512.5	242	3 x 400	1200	1352	2863	1200	1352	2863	1200	1352	2863	1425	1605	3400	1425	1605	3400	1425	1605	3400
ING	T5	512.5	242	3 x 400	1200	1352	2863	1200	1352	2863	1200	1352	2863	1425	1605	3400	1425	1605	3400	1425	1605	3400
JOR	T1	138	13.2	83.5//100	De-rated. Please refer to Appendix 2.																	
JOR	T2	138	13.2	83.5//100	De-rated. Please refer to Appendix 2.																	
KDS	T1	512.5	242	3 x 100	300	338	716	300	338	716	300	338	716	356	401	849	356	401	849	356	401	849
KDS	T3	236	138	150//168	168	411	703	168	411	703	168	411	703	200	489	837	200	489	837	200	489	837
KDS	T4	236	138	150//168	168	411	703	168	411	703	168	411	703	200	489	837	200	489	837	200	489	837
KLY	T1	512.5	242	3 x 100	300	338	716	504	568	1202	403	454	961	356	401	849	504	568	1202	475	535	1133
KLY	T4	512.5	242	3 x 100	300	338	716	535	603	1276	372	419	888	356	401	849	600	676	1431	438	493	1045
MDN	T1	512.5	242	3 x 400	1200	1352	2863	1200	1352	2863	1200	1352	2863	1425	1605	3400	1425	1605	3400	1425	1605	3400
MDN	T2	512.5	242	3 x 400	1200	1352	2863	1200	1352	2863	1200	1352	2863	1200	1352	2863	1425	1605	3400	1425	1605	3400
MDN	T3	512.5	242	3 x 400	1200	1352	2863	1200	1352	2863	1200	1352	2863	1425	1605	3400	1425	1605	3400	1425	1605	3400
MSA	T1	512.5	242	3 x 200	600	676	1431	600	676	1431	600	676	1431	714	804	1703	714	804	1703	714	804	1703
MSA	T2	512.5	242	3 x 200	600	676	1431	600	676	1431	600	676	1431	714	804	1703	714	804	1703	714	804	1703
MSA	T5	230	138	150	150	377	628	150	377	628	150	377	628	178	447	745	178	447	745	178	447	745
NIC	T2	512.5	242	3 x 400	1200	1352	2863	1200	1352	2863	1200	1352	2863	1425	1605	3400	1425	1605	3400	1425	1605	3400
NIC	T3	512.5	242	3 x 400	1200	1352	2863	1200	1352	2863	1200	1352	2863	1425	1605	3400	1425	1605	3400	1425	1605	3400
NIC	T5	230	138	300	De-rated. Please refer to Appendix 2.																	
NIC	T6	230	138	300	De-rated. Please refer to Appendix 2.																	
NLY	PST2	230	230	400	400	1004	1004	400	1004	1004	400	1004	1004	400	1004	1004	400	1004	1004	400	1004	1004
REV	T7	512.5	242	3 x 105	315	355	752	315	355	752	315	355	752	375	422	895	375	422	895	375	422	895
REV	T8	512.5	242	3 x 105	315	355	752	315	355	752	315	355	752	375	422	895	375	422	895	375	422	895
ROS	T1	345	238	3 x 150	450	753	1092	738	1235	1790	580	971	1407	534	894	1295	900	1506	2183	711	1190	1725
SAM	T4	230	138	150	150	377	628	256	643	1071	177	444	741	178	447	745	300	753	1255	214	537	895

APPENDIX 3 - Transmission Transformer Equipment Rating

Substation	Tx	Vrated HV Winding	Vrated LV Winding	Rated MVA (Note dual MVA is 55˚C//65˚C Temp. Rise)	Summer Normal 30˚C Ambient			Summer Emergency 30˚C Ambient						Winter Normal 0˚C Ambient			Winter Emergent 0˚C Ambient					
								30 min.			8 hours						30 min.			8 hours		
					MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)
SAY	T2	230	138	150	150	377	628	150	377	628	150	377	628	178	447	745	178	447	745	178	447	745
SAY	T3	230	138	150	150	377	628	150	377	628	150	377	628	178	447	745	178	447	745	178	447	745
SBK	T11	500	138	300	300	346	1255	300	346	1255	300	346	1255	356	411	1489	356	411	1489	356	411	1489
SBK	T12	500	138	300	300	346	1255	300	346	1255	300	346	1255	356	411	1489	356	411	1489	356	411	1489
SBK	T21	525.3	242	600	600	659	1431	600	659	1431	600	659	1431	714	785	1703	714	785	1703	714	785	1703
SBK	T22	525.3	242	600	600	659	1431	600	659	1431	600	659	1431	714	785	1703	714	785	1703	714	785	1703
SEL[3,4]	T1	512.5	242	3 x 400	1200	1352	2863	1677	1889	4000	1428	1609	3407	1425	1605	3400	1677	1889	4000	1677	1889	4000
SEL	T2	512.5	242	3 x 200//224	672	757	1603	930	1048	2219	750	845	1789	798	899	1904	1140	1284	2720	894	1007	2133
SEL[5]	T3	512.5	242	3 x 200//224	672	757	1603	1062	1196	2534	887	999	2116	798	899	1904	1257	1417	3000	1035	1166	2469
SEL[6,7]	T4	512.5	242	3 x 400	1200	1352	2863	1677	1889	4000	1530	1724	3650	1425	1605	3400	1677	1889	4000	1677	1889	4000
SKA	T1	512.5	287	3 x 200//224	672	757	1352	672	757	1352	672	757	1352	798	899	1605	798	899	1605	798	899	1605
SKA	T2	512.5	287	3 x 200//224	672	757	1352	672	757	1352	672	757	1352	798	899	1605	798	899	1605	798	899	1605
SKA	T6	275	132	93	93	195	407	93	195	407	93	195	407	110	231	481	110	231	481	110	231	481
SLS	T1	230	138	150	De-rated. Please refer to Appendix 2.																	
SVA	T1	236	138	168	168	411	703	219	536	916	178	435	745	200	489	837	268	656	1121	213	521	891
SVA	T3	236	138	150	150	367	628	150	367	628	150	367	628	178	435	745	178	435	745	178	435	745
TKW	T2	512.5	242	3 x 100//112	336	379	802	336	379	802	336	379	802	400	451	954	400	451	954	400	451	954
TKW	T3	512.5	242	3 x 100	300	338	716	300	338	716	300	338	716	356	401	849	356	401	849	356	401	849
TKW	T4	230	138	150//168	168	422	703	168	422	703	168	422	703	200	502	837	200	502	837	200	502	837
TKW	T5	230	138	150//168	168	422	703	168	422	703	168	422	703	200	502	837	200	502	837	200	502	837
VIT	T5	236	138	150//180	180	440	753	180	440	753	180	440	753	214	524	895	214	524	895	214	524	895
VIT	T6	236	138	150//180	180	440	753	180	440	753	180	440	753	214	524	895	214	524	895	214	524	895
VIT	T9	236	138	150//168	168	411	703	211	516	883	178	435	745	200	489	837	261	639	1092	216	528	904
VIT	T10	236	138	150//168	168	411	703	211	516	883	178	435	745	200	489	837	261	639	1092	216	528	904
VIT	PST1	230	230	650	650	1632	1632	650	1632	1632	650	1632	1632	650	1632	1632	650	1632	1632	650	1632	1632
VNT	T1	230	138	150//168	168	422	703	219	550	916	174	437	728	200	502	837	273	685	1142	208	522	870
VNT	T2	230	138	150//168	168	422	703	219	550	916	174	437	728	200	502	837	273	685	1142	208	522	870
VVW	T2	230	138	150//168	168	422	703	168	422	703	168	422	703	200	502	837	200	502	837	200	502	837
VVW	T3	230	138	150//168	168	422	703	168	422	703	168	422	703	200	502	837	200	502	837	200	502	837
WAH	T1	353.5	13.2	75	75	122	3280	75	122	3280	75	122	3280	89	145	3893	89	145	3893	89	145	3893

APPENDIX 3 - Transmission Transformer Equipment Rating

Substation	Tx	Vrated HV Winding	Vrated LV Winding	Rated MVA (Note dual MVA is 55˚C//65˚C Temp. Rise)	Summer Normal 30˚C Ambient			Summer Emergency 30˚C Ambient						Winter Normal 0˚C Ambient			Winter Emergent 0˚C Ambient					
								30 min.			8 hours						30 min.			8 hours		
					MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)	MVA	HV (Amp)	LV (Amp)
WSN	T2	512.5	242	3 x 400	De-rated. Please refer to Appendix 2.																	
WSN	T4	512.5	242	3 x 400	1200	1352	2863	1200	1352	2863	1200	1352	2863	1425	1605	3400	1425	1605	3400	1425	1605	3400

Notes:

1. Current to MVA conversion is based on the transformer's rated voltage
2. BRT T4 Summer and Winter 30 min LV rating limited by 2B4 Conductor rating.
3. SEL T1 0°C ambient 30 min and 8 h emergency limited by 2D1 rated at 4000 A
4. SEL T1 30°C ambient 30 min emergency limited by 2D1 rated at 4000 A
5. SEL T3 0°C ambient 30 min limited by 2D3 rated at 3000 A
6. SEL T4 30°C ambient 30 min emergency limited by 2D4 rated at 4000 A
7. SEL T4 0°C ambient 30 min and 8 h emergency limited by 2D4 rated at 4000 A
8. DMR T1 0°C ambient 30 min emergency limited by 2D1 at 4000 A
9. DMR T2 0°C ambient 30 min emergency limited by 2D2 at 4000 A
10. BR1 T3 0°C and 30°C ambient 30 min and 8 h emergency limited by 60DCB3 at 800 A