BC HYDRO

T&D SYSTEM OPERATIONS

ATTACHMENT 1 OF
SYSTEM OPERATING ORDER 7T-34

SI 500 kV OPERATION (2L277 CONNECTED TO NLY)
Supersedes Attachment 1 of SOO 7T-34 issued 12 January 2023

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Original approved by:
Ben Braconnier for:

APPROVED BY: _____

Steven Cullen
Operations Planning Manager,
T&D System Operations

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<mark>Highlight Denotes Revision</mark>

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1.0 GENERAL SYSTEM INFORMATION AND REQUIREMENTS

1.1 Line Ratings

1.1.1 Continuous Ratings
Refer to System Operating Order 5T-10 for the source of the following data.

500 kV Circuit	Variable Name Used in Generation Shedding Tables	Conductor Continuous Rating (Amp)		Corresponding Continuous MW Rating (MW = 1.732 * Rating in KA * 525 kV * 0.99 pf)	
		Summer (Based on 30º C ambient)	Winter (Based on 10º C ambient)	Summer (Based on 30º C ambient)	Winter (Based on 10º C ambient)
5L40	5L40_Norm_Rating	2772	3000 (CT limit)	2495	2701 (CT limit)
5L41	5L41_Norm_Rating	1900 (CHP limit)	1900 (CHP limit)	1710 (CHP limit)	1710 (CHP limit)
5L41_BypassCHP	5L41_BypassCHP_Norm_rating	2743	3000 (CT or CHP 5BP1 limit)	2469	2701 (CT or CHP 5BP1 limit)
5L42	5L42_Norm_Rating	2180 (CRK limit)	2180 (CRK limit)	1962 (CRK limit)	1962 (CRK limit)
5L42_BypassCRK	5L42_BypassCRK_Norm_Rating	2328	3000 (CT limit)	2096	2701 (CT limit)
5L44	5L44_Norm_Rating	2628	3000 (CT limit)	2366	2701 (CT limit)
5L45	5L45_Norm_Rating	2305	3000 (CT limit)	2075	2701 (CT limit)
5L71	5L71_Norm_Rating	2332	3000 (SYA1 limit)	1999 (@ 500 kV)	2572 (@500 kV) (SYA1 limit)
5L71_BypassSYA1	5L71_BypassSYA1_Norm_Rating	2332	3000 (CT or SYA1 5BP1 limit)	1999 (@ 500 kV)	2572 (@500 kV) (CT or SYA1 5BP1 limit)
5L72	5L72_Norm_Rating	2332	3000 (SYA2 limit)	1999 (@ 500 kV)	2572 (@500 kV) (SYA2 limit)
5L72_BypassSYA2	5L71_BypassSYA2_Norm_Rating	2332	3000 (CT or SYA2 5BP2 limit)	1999 (@ 500 kV)	2572 (@500 kV) (CT or SYA2 5BP2 limit)
5L75	5L75_Norm_Rating	3000 (CT limit)	3000 (CT limit)	2701	2701 (CT limit)
5L76	5L76_Norm_Rating	2660	3000 (DS limit)	2395	2701 (DS limit)
5L77	5L77_Norm_Rating	2428	3000 (CT limit)	2186	2701 (CT limit)
5L79	5L79_Norm_Rating	3000 (CT limit)	3000 (CT limit)	2701 (CT limit)	2701 (CT limit)
5L81	5L81_Norm_Rating	2120 (AMC1 limit)	2120 (AMC1 limit)	1908 (AMC1 limit)	1908 (AMC1 limit)
5L81_BypassAMC1	5L81_BypassAMC1_Norm_Rating	2305	3000 (CT or AMC1 5BP1 limit)	2075	2701 (CT or AMC1 5BP1 limit)
5L82	5L82_Norm_Rating	2120 (AMC2 limit)	2120 (AMC2 limit)	1908 (AMC2 limit)	1908 (AMC2 limit)
5L82_BypassAMC2	5L82_BypassAMC2_Norm_Rating	2452	3000 (CT or AMC2 5BP2 limit)	2207	2701 (CT or AMC2 5BP2 limit)
5L83	5L83_Norm_Rating	3000 (RYC limit)	3000 (RYC limit)	2701 (RYC limit)	2701 (RYC limit)
5L83_BypassRYC	5L83_BypassRYC_Norm_Rating	3000 (RYC 5BP1 limit)	3000 (RYC 5BP1 limit)	2701 (RYC 5BP1 limit)	2701 (RYC 5BP1 limit)
5L87	5L87_Norm_Rating	2400 (GUI limit)	2400 (GUI limit)	2160 (GUI limit)	2160 (GUI limit)
5L87_BypassGUI	5L87_BypassGUI_Norm_rating	3000 (CT limit)	3000 (CT limit)	2701 (CT limit)	2701 (CT limit)

230 kV Circuit	Variable Name Used in Generation Shedding Tables	Conductor Continuous Rating (Amp)		Corresponding Continuous MW Rating (MW = 1.732 * Rating in KA * 235 kV * 0.95 pf)	
		Summer (Based on 30º C ambient)	Winter (Based on 10º C ambient)	Summer (Based on 30º C ambient)	Winter (Based on 10º C ambient)
2L22	2L22_Norm_Rating	989	1200 (CT & DS limit)	382	464 (CT & DS limit)
2L20	2L20_Norm_Rating	1052	1217	407	471
2L27	2L27_Norm_Rating	989	1200 (DS limit)	382	464 (DS limit)
2L31	2L31_Norm_Rating	650	830	251	321
2L45	2L45_Norm_Rating	660	812	255	314
2L50	2L50_Norm_Rating	630	730	244	282
2L51COK	2L51COK_Norm_Rating	1075	1247	416	482
2L51HPN	2L51HPN_Norm_Rating	1089	1259 (Note 1)	421	487 (Note 1)
2L56	2L56_Norm_Rating	660	806	255	312
2L64	2L64_Norm_Rating	660	800	255	309

Note 1: 2L51HPN_Norm_Rating will be limited at 1200 A and 464 MW (HPN bus breaker 2CB8 DS limit) if HPN 2CB7 is OOS (This is for information only and is not implemented in TSAPM).

1.1.2 Overload-Ratings

Refer to System Operating Order 5T-10 for the source for the following data.

500 kV Circuit	Variable Name Used in Generation Shedding Tables	Conductor Over-Rating (Amp)		Corresponding MW Over-Rating (MW = 1.732 * Rating in KA * 500 kV * 0.99 pf)	
		Summer (Based on 30º C ambient)	Winter (Based on 10º C ambient)	Summer (Based on 30º C ambient)	Winter (Based on 10º C ambient)
5L40	5L40_Over_Rating	3000 (CT limit)	3000 (CT limit)	2572	2572 (CT limit)
5L41	5L41_Over_Rating	2565 (CHP limit)	2565 (CHP limit)	2199	2199 (CHP limit)
5L41_BypassCHP	5L41_BypassCHP_Over_Rating	3000 (CT or CHP 5BP1 limit)	3000 (CT or CHP 5BP1 limit)	2572	2572 (CT or CHP 5BP1 limit)
5L42	5L42_Over_Rating	2856	2943 (CRK limit)	2449	2523 (CRK limit)
5L42_BypassCRK	5L42_BypassCRK_Over_Rating	2856	3000 (CT limit)	2449	2572 (CT limit)
5L44	5L44_Over_Rating	3000 (CT limit)	3000 (CT limit)	2572	2572 (CT limit)
5L45	5L45_Over_rating	3000 (CT limit)	3000 (CT limit)	2572	2572 (CT limit)
5L71	5L71_Over_Rating	2920	3000 (CT limit)	2503	2572 (CT limit)
5L71_BypassSYA1	5L71_BypassSYA1_Over_Rating	2920	3000 (CT or SYA1 5BP1 Limit)	2503	2572 (CT or SYA1 5BP1 Limit)
5L72	5L72_Over_Rating	2920	3000 (CT limit)	2503	2572 (CT limit)
5L72_BypassSYA2	5L72_BypassSYA2_Over_Rating	2920	3000 (CT or SYA2 5BP2 Limit)	2503	2572 (CT or SYA2 5BP2 Limit)
5L75	5L75_Over_Rating	3000 (CT limit)	3000 (CT limit)	2572 (CT limit)	2572 (CT limit)
5L76	5L76_Over_Rating	3000 (DS limit)	3000 (DS limit)	2572 (DS limit)	2572 (DS limit)
5L77	5L77_Over_Rating	3000 (CT limit)	3000 (CT limit)	2572 (CT limit)	2572 (CT limit)
5L79	5L79_Over_Rating	3000 (CT limit)	3000 (CT limit)	2572 (CT limit)	2572 (CT limit)
5L81	5L81_Over_Rating	2850	2862 (AMC1 limit)	2443	2454 (AMC1 limit)
5L81_BypassAMC1	5L81_BypassAMC1_Over_Rating	2850	3000 (CT or AMC 5BP1 limit)	2443	2572 (CT or AMC1 5BP1 limit)
5L82	5L82_Over_Rating	2862 (AMC2 limit)	2862 (AMC2 limit)	2454 (AMC2 limit)	2454 (AMC2 limit)
5L82_BypassAMC2	5L82_BypassAMC2_Over_Rating	3000 (79ºC or CT or AMC2 5BP2 limit)	3000 (CT or AMC2 5BP2 limit)	2572 (79ºC or CT or AMC2 5BP2 limit)	2572 (CT or AMC2 5BP2 limit)
5L83	5L83_Over_Rating	3000 (CT or CB limit)	3000 (CT or CB limit)	2572 (CT or CB limit)	2572 (CT or CB limit)
5L83_BypassRYC	5L83_BypassRYC_Over_Rating	3000 (RYC 5BP1 limit)	3000 (RYC 5BP1 limit)	2572 (RYC 5BP1 limit)	2572 (RYC 5BP1 limit)
5L87	5L87_Over_Rating	3000 (CT limit)	3000 (CT limit)	2572 (CT limit)	2572 (CT limit)
5L87_BypassGUI	5L87_Bypass_Over_Rating	3000 (CT limit)	3000 (CT limit)	2572 (CT limit)	2572 (CT limit)

230 kV Circuit	Variable Name Used in Generation Shedding Tables	Conductor Over-Rating (Amp)		Corresponding MW Over-Rating	
		Summer (Based on 30º C ambient)	Winter (Based on 10º C ambient)	Summer (Based on 30º C ambient)	Winter (Based on 10º C ambient)
2L20	2L20_Over_Rating	1374	1557	520	589
2L22	2L22_Over_Rating	989	1200 (CT & DS limit)	382	464 (CT & DS limit)
2L27	2L27_Over_Rating	989	1200 (DS limit)	382	464 (DS limit)
2L31	2L31_Over_Rating	900	1070	341	405
2L45	2L45_Over_Rating	891	1018	338	385
2L50	2L50_Over_Rating	924	985	350	373
2L51COK	2L51COK_Over_Rating	1500 (CT Limit)	1500 (CT Limit)	568 (CT Limit)	568 (CT Limit)
2L51HPN	2L51HPN_Over_Rating	1500 (CT Limit) Note 3	1500 (CT Limit) Note 3	568 (CT Limit) Note 3	568 (CT Limit) Note 3
2L56	2L56_Over_Rating	1067	1146	404	434
2L64	2L64_Over_Rating	1145	1250	433	473
2L294	2L294_Over_Rating	1108	1200 (CT limit)	419	454
2L129	2L129_0.5hr_Rating	Refer to Attachment 3 of SOO 7T-41.			

Note 1: 2L22 or 2L27 continuous rating is used for its over-rating. 2L22 or 2L27 over-current protection will send an alarm when the current exceeds its continuous rating.

Note 2: 2L20, 2L31, 2L50, 2L51, 2L56, 2L64, 2L294 MW over-ratings are calculated by: 1.732 * Rating in KA * 230 kV * 0.95 pf

Note 3: 2L51HPN_Over_Rating will be limited at 1200 A and 454 MW (HPN bus breaker 2CB8 DS limit) if HPN 2CB7 is OOS (This is for information only and is not implemented in TSAPM).

1.2   General Pre-outage Restrictions

- **MCA**
  - MCA G1 and G2 shall not exceed 492.0 MW each, MCA G3 and G4 shall not exceed 493.5 MW each, and MCA G5 and G6 shall not exceed 520.3 MW each. This restriction is applicable to all the tables in Attachment 1 except for Table 1.9 (5L71 AND 5L72 O.O.S.), Table 2.9 (5L83 AND 5L71 AND 5L72 O.O.S.), or Table 2.18 (5L83 AND 5L87 AND (5L71 or 5L72) O.O.S.).
  - Maximum transfer on cut plane (5L71 + 5L72) MCA is 2888 MW. The nomogram for (5L71 + 5L72) MCA transfer vs AB to BC Transfer is given below. This nomogram is applicable to all the tables in Attachment 1 except for Tables 1.9 (5L71 AND 5L72 O.O.S.), Tables 2.7 (5L83 AND 5L71 AND SYA 5CX2 O.O.S.), 2.8 (5L83 AND 5L72 AND SYA 5CX1 O.O.S.), 2.9 (5L83 AND 5L71 AND 5L72 O.O.S.), or 2.18 (5L83 AND 5L87 AND (5L71 or 5L72) O.O.S.), which have greater constraints noted.
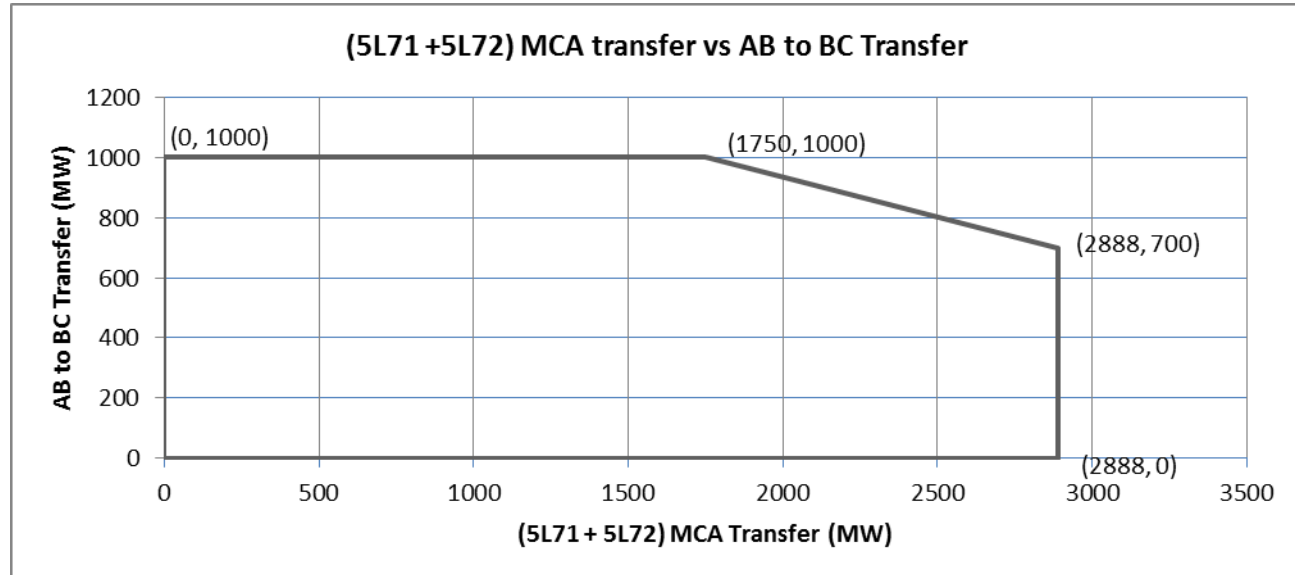
- The following combinations of MCA 500 kV CBs shall not normally be scheduled O.O.S., to avoid splitting MCA generation and radially connecting to 5L71 or 5L72. These configurations result in undesirable generation shedding or violating minimum unit online requirement s for parallel line contingency or and some system contingencies:
    - 5CB6 and 5CB9 O.O.S., or
    - 5CB6 and 5CB10 O.O.S., or
    - 5CB7 and 5CB10 O.O.S., or
    - 5CB9 and 5CB11 O.O.S.

  If any of the above requirements is violated, a TSA-PM alarm of "MUST NOT OPERATE IN THIS CONDITION" will occur. There are exceptional cases that Operators can override in real time upon careful interrogation of the one-line (such as the cases for MCA 500KV line or lead shaft outages that extend to these breakers and included bus sections).

- **REV**
  - Each of REV G1, G2, G3 and G4 shall not exceed 500 MW. REV G5 shall not exceed 518 MW. The REV requirements are applicable to all the tables in Attachment 1. Maximum transfer on cut plane (5L75 + 5L77) REV is 2562 MW. However, the transfer can exceed 2000 MW only if all of the following conditions exist:
    - One of ACK 5CX1 and 5CX2 is in service, or available only if ACK500 > 522 kV with none of ACK 5CX1 and 5CX2 in service, **and**
    - The other ACK 500 kV capacitor bank is available if BCH load (including losses) >= 8500 MW.

  The nomogram for (5L75 + 5L77) REV transfer vs AB to BC Transfer is given below. This nomogram is applicable to all the tables in Attachment 1.

(5L75 +5L77) REV transfer vs AB to BC Transfer

Chart: AB to BC Transfer (MW) on Y-axis (0 to 1200) vs (5L75 + 5L77) REV Transfer (MW) on X-axis (0 to 3000). Line points: (0, 1000), (1700, 1000), (2562, 750), (2562, 0).
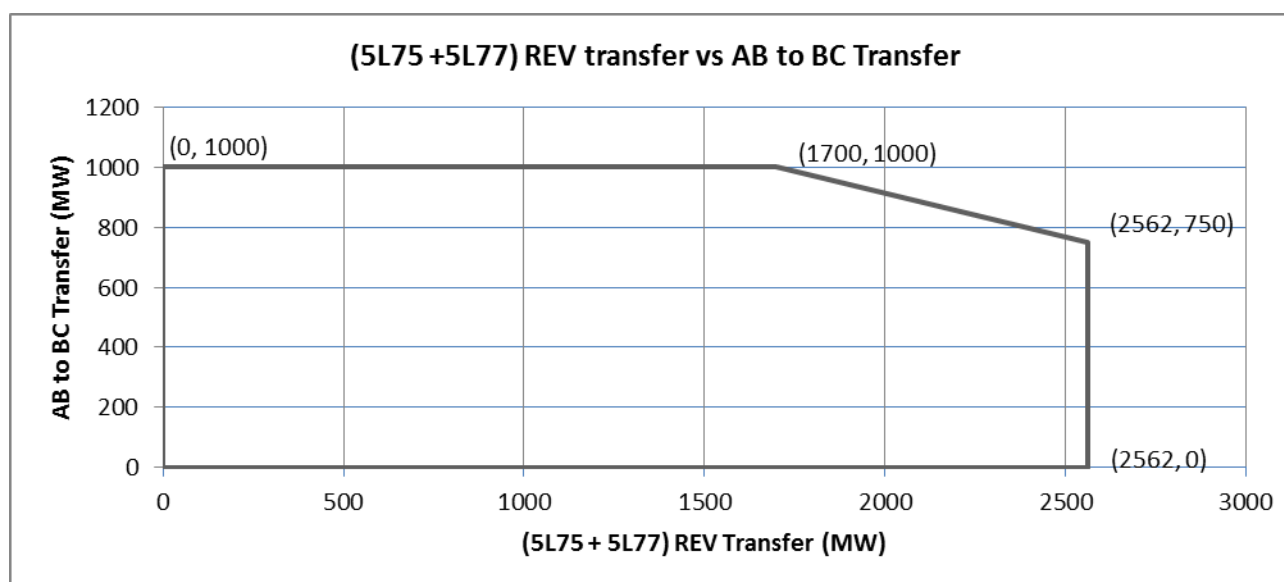
- **ACK 5CX1, ACK 5CX2, and ACK Auto-Var Scheme (applicable to all the tables in Attachment 1)**
  At least one of ACK 5CX1 and 5CX2 must be available. ACK Auto-Var scheme must be in service if gen-shedding is armed at REV for double contingencies 5L81 & 5L82, 5L81 & 5L83, 5L82 & 5L83, or 5L76 & 5L79, or if 5L91 SEL + 5L96 SEL >= 1800 MW.

- **SEL Auto-Var Scheme (applicable to all the tables in Attachment 1)**
  SEL Auto-Var scheme must be in service if SEL 5RX3 is available.

- **Definitions of FBC's VAS-VNT path and VAS-WTS Path (applicable to all the tables in Attachment 1)**
  Please refer to FortisBC's system one-line diagram 4-000-8011 for the following definitions of the VAS-VNT path and the VAS-WTS path:

  The VAS-VNT path is defined as the connection of VAS230-RGA230-DG BELL230-LEE230-VNT230. The path consists of four sections connected in series:
  - Section 1 is the connection of VAS230-RGA230 which consists of 75L and 76L in parallel. There are parallel lower voltage connections which link this section, therefore, this section of the path shall be treated as closed regardless of its status. Only when 75L AND 76L AND the lower voltage parallel connections are open, this section of the path shall be treated as open.
  - Section 2 is the connection of RGA230-DG BELL230. There is no parallel lower voltage connection to link this section.
  - Section 3 is the connection of DG BELL230-LEE230. There are parallel lower voltage connections to link this section. When this section is open, the corresponding parallel connections which link this section must be open.
  - Section 4 is the connection of LEE230-VNT230. There is no parallel low voltage connection to link this section.

  The VAS-WTS path is defined as the connection of VAS230-BEN230-BEN63-BEN161-KET161-GFT161-ASM63-WTS63. The path consists of three sections connected in series:
  - Section 1 is the connection of VAS230-BEN230-BEN63 which consists of 40L in series with BEN T1. There are parallel lower voltage connections which link this section, therefore, this section of the path shall be treated as closed regardless of its status. Only when 40L/BEN T1 AND the lower voltage parallel connections are open, this section of the path shall be treated as open.
  - Section 2 is the connection of BEN63-BEN161-KET161-GFT161. There is no parallel low voltage connection to link this section.
  - Section 3 is the connection of GFT161-ASM161-ASM63-WTS63. There are parallel low voltage connections to link this section. When this section is open, the corresponding parallel connections which link this section must be open.

2.0   PRE-OUTAGE RESTRICTIONS FOR CONTINGENCIES:

Each of the tables in Attachment 1 specifies which pre-outage restrictions in this section are applicable.

Note 1:   Removed

Note 2:   **5L91 or 5L96 or 5L98 or (5L96 AND 5L98) Contingency**

Limit: 2L112 NLY + BDY gen MW < 1200 MW

Note 3:   **5L91 and 5L96 Contingency**

- Limit: 5L91 SEL + 5L96 SEL + Y + Z < 2500 MW
- If SEL 5RX3 is available, then limit:
  (FBC injection into SEL area) + W < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW – Z
  Otherwise, limit:
  (FBC injection into SEL area) + W < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW – 1 KCL @ MIN.MW - Z
  Where FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW
      FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
      Y = 2L112 NLY if 2L112 NLY > 0, or
      Y = 0 if 2L112 NLY <= 0
      Z = 48L KET if VAS-WTS loop is closed, or
      Z = 0 if VAS-WTS loop is open.
      W = AB to BC MW if AB to BC > 0 MW, or
      W = 0 if AB to BC <=0 MW
- Alarm if 5L91 SEL + 5L96 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
      If 5L91 SEL + 5L96 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW

If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91 and 5L96.

Note 4:   Removed

3.0   GENERAL POST-CONTINGENCY REQUIREMENTS

Note 1:   **Minimum Unit On-Line Post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units**

If gen shedding is armed at MCA, REV, SEV or KCL, for any contingencies in Attachment 1, then:
- Keep a minimum of 2 MCA, 2 REV, 1 SEV and 1 KCL units on-line post-shedding, unless specifically specified in the gen-shedding tables.
- The gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding. At least one post-shedding online units shall be configured to keep the above main buses electrically connected. The detailed requirements are specified in Section 2 of SOO 7T-34 Att2.
  - If KCL 2CB5 is O.O.S., DO NOT select KCL G3 for shedding to avoid loss of 2L295 simultaneously;
  - If KCL 2CB13 is O.O.S., DO NOT select KCL G1 for shedding to avoid loss of 2L288 simultaneously;
  - If KCL 2CB16 is O.O.S., DO NOT select KCL G1 for shedding to avoid loss of 2L299 simultaneously.
- If the whole KCL plant is shutdown (4 generators off line) in pre-contingency condition, then keep a minimum of 2 MCA, 2 REV, 1 SEV and 2/3 equivalent SEV units on-line post-shedding, unless specifically specified in the gen-shedding tables.

WAN G4 shall not participate in any generation shedding requirement, this is a generic rule in TSA-PM implementation. If WAN generation shedding is armed for any contingencies, then keep a minimum of 1 WAN unit on-line post-shedding, this is a generic rule also.

If gen shedding is armed at ALH, BRX or WAX for any contingencies, these generation plants may be shed down to 0 MW.
The relationships between 1 unit at KCL, ALH, WAX and BRX AND 1 SEV equivalent in all tables in Attachment 1 are given below:

1 KCL unit = 2/3 equiv. SEV unit
1 ALH unit = 1/3 equiv. SEV unit
1 WAX unit = 1 equiv. SEV unit
1 BRX unit = 1/3 equiv. SEV unit

Note 2:   **Contingencies 5L44, 5L81 AND 5L82, 5L81 AND 5L83, 5L82 AND 5L83**
If generation shedding is armed at GMS/PCN, the minimum units on line requirements for GMS/PCN specified in Sections 5.5.1 and 5.5.2 in SOO 7T-13 shall be applied.

Note 3:   **5L75 Contingency, or**
5L75 Contingency with ACK 5CB5 O.O.S. (loss of both 5L75 & 5L76), or
5L76 Contingency with ACK 5CB8 O.O.S. (loss of both 5L75 & 5L76)

If TSA-PM alarms "VIOLATION_5L77_NORM_RATING" post contingency, the BC Hydro Control Centre staff shall reduce REV generation further to bring the flow on 5L77 REV below the rating within 30 minutes.

Note 4:   **5L77 Contingency**
If TSA-PM alarms "VIOLATION_5L75_NORM_RATING" post contingency, the BC Hydro Control Centre staff shall reduce REV generation further to bring the flow on 5L75 REV below the rating within 30 minutes.

Note 5:   **5L79 Contingency (Applicable to all the tables in Attachment 1 except for 5L91 O.O.S. Table 1.19)**
If TSA-PM alarms "VIOLATION_5L76_NORM_RATING" post-contingency, the BC Hydro Control Centre staff shall take the following actions to bring the flow on 5L76 ACK below the rating within 30 minutes:
- Reduce REV or SIE generation, or
- Reduce flow on 2L112 from BDY to NLY, or
- Reduce import from Alberta

Note 6:   **Contingencies 5L81, 5L82, 5L83, 5L87, 5L81 & 5L82, 5L81 & 5L83, 5L82 & 5L83 (Applicable to all the tables in Attachment 1)**
If TSA-PM alarms "VIOLATION_5L81_NORM_RATING" or "VIOLATION_5L82_NORM_RATING" or "VIOLATION_5L83_NORM_RATING" or "VIOLATION_5L87_NORM_RATING" or "VIOLATION_5L81BYPASS_AMC1_NORM_RATING" or "VIOLATION_5L82BYPASS_AMC2_NORM_RATING" or "VIOLATION_5L83BYPASS_RYC_NORM_RATING" or "VIOLATION_5L87BYPASS_GUI_NORM_RATING" post-contingency, the BC Hydro Control Centre staff shall take the following actions to bring the flow on 5L81 NIC or 5L82 NIC or 5L83 NIC or 5L87 NIC below their rating within 30 minutes:
- Reduce MCA or REV or SIE generation, or
- Reduce flow on 2L112 from BDY to NLY, or
- Reduce import from Alberta

If TSA-PM alarms "VIOLATION_5L41_NORM_RATING" or "VIOLATION_5L42_NORM_RATING" or "VIOLATION_5L41BYPASS_CHP_NORM_RATING" or "VIOLATION_5L42BYPASS_CRK_NORM_RATING" post-contingency, the BC Hydro Control Centre staff shall reduce Peace generation to bring the flow on 5L41 KLY or 5L42 KLY below their rating within 30 minutes.

Note 7: **Contingencies 5L91, 5L96, 5L98, 5L96 & 5L98**
(Applicable to all the tables in Attachment 1 except as indicated in the 5L91 O.O.S. Table 1.19 (Contingencies 5L96, 5L98, 5L96 & 5L98), and 5L91 contingency in the 5L96 O.O.S. Table 1.20, 5L98 O.O.S. Table 1.21, 5L96 & 5L98 O.O.S. Table 1.22 and 5L94 & 5L96 O.O.S. Table 1.25)

If generation shedding is armed, keep a minimum of 2 SEV, 1 KCL (with high side 2CBs in service) and 1/3 equivalent SEV units on-line post-shedding, or keep a minimum of 2 SEV and 1 equivalent SEV units on-line post-shedding if KCL plant is shutdown.

Note 8: **5L96 and 5L98 Contingency**
(Applicable to all the tables in Attachment 1 except for the 5L96 O.O.S. Table 1.20, 5L98 O.O.S. Table 1.21, 5L96 & 5L98 O.O.S. Table 1.22 and 5L94 & 5L96 O.O.S. Table 1.25)
This double contingency may happen only if:
- VAS 5CB12 O.O.S., 5L96 contingency with VAS 5CB14 breaker failure, or
- VAS 5CB22 O.O.S., 5L96 contingency with VAS 5CB13 breaker failure, or
- VAS 5CB13 O.O.S., 5L98 contingency with VAS 5CB22 breaker failure, or
- VAS 5CB14 O.O.S., 5L98 contingency with VAS 5CB12 breaker failure.

Note 9: **Contingency 5L81**
(Applicable to all the tables in Attachment 1 except for Tables:
- **1.12 (5L76 O.O.S.),**
- **1.14 (5L81 O.O.S.),**
- **2.12 (5L83 AND 5L76 O.O.S.), and**
- **2.14 (5L83 AND 5L81 O.O.S.))**

If generation shedding is required, the armed REV units for shedding for 5L76 contingency shall be selected first for arming for 5L81 contingency.

Note: This is to avoid excessive generation shedding for loss of both 5L76 and 5L81 which would happen in the following situations due to 5L76 and 5L81 sharing the common circuit breaker of NIC 5CB14:
- A SLG fault with NIC 5CB14 breaker failure (NERC/WECC Category C2 or C8 event), or
- 5L76 contingency with NIC 5CB24 O.O.S. (N-1-1 event), or
- 5L81 contingency with NIC 5CB4 O.O.S. (N-1-1 event).

Note 10: **Contingency 5L82**
(Applicable to all the tables in Attachment 1 except for Tables:
- **1.2 (5L71 O.O.S.),**
- **1.3 (5L72 O.O.S.),**
- **1.7 (5L71 and SYA 5CX2 O.O.S.),**
- **1.8 (5L72 and SYA 5CX1 O.O.S.),**
- **1.9 (5L71 and 5L72 O.O.S.),**
- **1.15 (5L82 O.O.S),**
- **2.2 (5L83 and 5L71 O.O.S),**
- **2.3 (5L83 and 5L72 O.O.S.),**
- **2.7 (5L83 and 5L71 and SYA 5CX2 O.O.S.),**
- **2.8 (5L83 and 5L72 and SYA 5CX1 O.O.S.), and**
- **2.9 (5L83 and 5L71 and 5L72 O.O.S.))**

If generation shedding is required, the armed MCA units for shedding for 5L71 (3P) contingency shall be selected first for arming for 5L82 contingency.

Note: This is to avoid excessive generation shedding for loss of both 5L71 and 5L82 which would happen in the following situations due to 5L71 and 5L82 sharing the common circuit breaker of NIC 5CB18:
- A SLG fault with NIC 5CB18 breaker failure (NERC/WECC Category C2 or C8 event), or
- 5L71 (3P) contingency with NIC 5CB28 O.O.S. (N-1-1 event), or
- 5L82 contingency with NIC 5CB8 O.O.S. (N-1-1 event).

Note 11: **Contingency 5L81 & 5L82**
(Applicable to all the tables in Attachment 1 except for Tables:
- **1.2 (5L71 O.O.S.), 1.3 (5L72 O.O.S.),**
- **1.7 (5L71 and SYA 5CX2 O.O.S.),**
- **1.8 (5L72 and SYA 5CX1 O.O.S.),**
- **1.9 (5L71 and 5L72 O.O.S.),**
- **1.12 (5L76 O.O.S.),**
- **1.14 (5L81 O.O.S.),**
- **1.15 (5L82 O.O.S.),**
- **2.2 (5L83 AND 5L71 O.O.S.),**
- **2.3 (5L83 AND 5L72 O.O.S.),**
- **2.7 (5L83 AND 5L71 AND SYA 5CX2 O.O.S.),**
- **2.8 (5L83 AND 5L72 AND SYA 5CX1 O.O.S.),**
- **2.9 (5L83 AND 5L71 AND 5L72 O.O.S.),**
- **2.12 (5L83 AND 5L76 O.O.S.),**
- **2.14 (5L83 AND 5L81 O.O.S.), and**
- **2.15 (5L83 AND 5L82 O.O.S.))**

If generation shedding is required AND
- If NIC 5CB4 is O.O.S., then the armed REV units for shedding for 5L76 contingency shall be selected first for arming for contingency 5L81 & 5L82, or
- If NIC 5CB8 is O.O.S., then the armed MCA units for shedding for 5L71 (3P) contingency shall be selected first for arming for contingency 5L81 & 5L82.

Note 12: **Contingency 5L81 & 5L83**
(Applicable to all the tables in Attachment 1 except for 1.12 (5L76 O.O.S.) and 1.14 (5L81 O.O.S.))

If generation shedding is required AND
- If NIC 5CB4 is O.O.S., then the armed REV units for shedding for 5L76 contingency shall be selected first for arming for contingency 5L81 & 5L83.

Note 13: **Contingency 5L82 & 5L83**
(Applicable to all the tables in Attachment 1 except for Tables 1.2 (5L71 O.O.S.), 1.3 (5L72 O.O.S.), 1.7 (5L71 and SYA 5CX2 O.O.S.), 1.8 (5L72 and SYA 5CX1 O.O.S.), 1.9 (5L71 and 5L72 O.O.S.) and 1.15 (5L82 O.O.S.))

If generation shedding is required AND
If NIC 5CB8 is O.O.S., then the armed MCA units for shedding for 5L71 (3P) contingency shall be selected first for arming for contingency 5L82 & 5L83.

Note 14: **Minimum Units On-Line Post-shed at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units for double contingencies 5L81 & 5L82, 5L81 & 5L83, or 5L82 & 5L83**
(Applicable to all the tables in Attachment 1 except for Tables:
- **1.9 (5L71 AND 5L72 O.O.S.),**
- **1.19 (5L91 O.O.S.),**
- **1.20 (5L96 O.O.S.),**
- **1.21 (5L98 O.O.S.),**
- **1.22 (5L96 AND 5L98 O.O.S.), and**
- **1.25 (5L94 AND 5L96 O.O.S.), or**
- **except for 5L81 & 5L82 double contingencies for specific requirements in each table from Table 2.2 (5L83 AND 5L71 O.O.S.) to 2.37 (5L83 AND 2L293 O.O.S.))**

If generation shedding is armed,
➢ keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 KCL (with high side 2CBs in service) units on-line post-shed if SEL 5RX3 is available, or
➢ keep a minimum of 2 MCA, 2 REV, 2 SEV, 1 KLC (with high side 2CBs in service) and 1 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable, or
➢ keep a minimum of 2 MCA, 2 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or
➢ keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.

The gen-shedding requirements at KCL for preventing KCL 230 kV main buses electrically disconnected post-shedding, and the requirement at WAN, ALH, BRX and WAX as specified in Note 1 in this section are applicable to this Note 14.

If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", "C5L81_83 - MAX ARMED SHED VIOLATION", or "C5L82_83 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
➢ If BC is exporting to US, then reduce BC to US export.
➢ If BC is importing from US, then
  ● reduce (SI and FBC) generation and increase Peace generation, or/and
  ● reduce (SI and FBC) generation and increase import from US

4.0 SETTINGS OF 2L112 OL RAS, 2L293 OL RAS AND NLY PST OVERLOAD PROTECTION TO RUNBACK NLY PST

The following settings are applicable to Relevant generation shedding tables in Attachment 1:

RAS Name	Variable Name Used in Generation Shedding Tables	RAS Setting (from Apr. 1st to Oct. 31st)	RAS Setting (from Nov. 1st to Mar. 31st)
2L112 OL RAS	2L112OLRAS_PickupMW	410 MW (1050A * 1.732 * 230kV * 0.98pf)	468 MW (1200A * 1.732 * 230kV * 0.98pf)
	2L112OLRAS_ResetMW	351 MW (900A * 1.732 * 230kV * 0.98pf)	371 MW (950A * 1.732 * 230kV * 0.98pf)
2L293 OL RAS	2L293OLRAS_PickupMW	410 MW (1050A * 1.732 * 230kV * 0.98pf)	468 MW (1200A * 1.732 * 230kV * 0.98pf)
	2L293OLRAS_ResetMW	351 MW (900A * 1.732 * 230kV * 0.98pf)	429 MW (1100A * 1.732 * 230kV * 0.98pf)
NLY PST Overload Protection	NLYPST_OL_PickupMW	392 MW (1004A * 1.732 * 230kV * 0.98pf)	392 MW (1004A * 1.732 * 230kV * 0.98pf)
	NLYPST_OL_ResetMW	200 MW	200 MW

5.0   LIST OF TABLES IN ATTACHMENT 1

Tables A through F may apply general requirements for gen shedding and DTT for specific loop configurations as common requirements across many configurations. The listings in Table 1 & 2 identify when combinations of Tables A-F are applicable in addition to the refined information in the current table.   For example the common tables A through F apply to the topology in Table 1.1, with additional requirements and information also listed in Table 1.1.

The Table 1 series (Tables 1.1 through 1.46) are for topologies with assets out of service from system normal.

The Table 2 series (Tables 2.2 through 2.45) are for the cases of 5L83 O.O.S with other assets also out of service.

Taken together, the two sets of tables can be considered as analogs. For example, Table 1.10 and 2.10 are for 5L75 O.O.S; with the second case also having 5L83 O.O.S.

Table 1 Series Listing:

Table No.	Table Name	VAS-WTS AND VAS-VNT Closed	VAS-WTS Open	VAS-VNT Open	VAS-WTS AND VAS-VNT Open
A	Reference table	Y			
B	Reference table		Y		
C	Reference table			Y	
D	Reference table				Y
E	Reference table for 5L71/5L72 (1P, 3P, 1P&1P, 1P&3P) Contingencies	No impact	No impact	No impact	No impact
F	Reference table for 5L75/5L77 (1P, 3P, 1P&3P) Contingencies	No impact	No impact	No impact	No impact
1.1	All SI, NIC/KLY - LM 500 kV Circuits and Series Capacitor Banks In-Service	Y	Y	Y	Y
1.2	5L71 O.O.S.	Y	Y	Y	Y
1.3	5L72 O.O.S.	Y	Y	Y	Y
1.4	SYA 5CX1 O.O.S	Y	Y	Y	Y
1.5	SYA 5CX2 O.O.S	Y	Y	Y	Y
1.6	SYA 5CX1 AND SYA 5CX2 O.O.S	Y	Y	Y	Y
1.7	5L71 AND SYA 5CX2 O.O.S.	Y	Y	Y	Y
1.8	5L72 AND SYA 5CX1 O.O.S	Y	Y	Y	Y
1.9	5L71 and 5L72 O.O.S.	Y	Y	Y	Y
1.10	5L75 O.O.S	Y	Y	Y	Y
1.11	5L77 O.O.S.	Y	Y	Y	Y
1.12	5L76 O.O.S.	Y	Y	Y	Y
1.13	5L79 O.O.S.	Y	Y	Y	Y
1.14	5L81 O.O.S.	Y	Y	Y	Y
1.15	5L82 O.O.S.	Y	Y	Y	Y
1.16	5L83 O.O.S.	Y	Y	Y	Y
1.17	5L87 O.O.S.	Y	Y	Y	Y
1.18	(Intentionally blank)				
1.19	5L91 O.O.S.	Y	Y	Y	Y
1.20	5L96 O.O.S.	Y	Y	Y	Y
1.21	5L98 O.O.S	Y	Y	Y	Y
1.22	5L96 AND 5L98 O.O.S.	Y	Y	Y	Y
1.23	5L92 O.O.S.	Y	Y	Y	Y
1.24	5L94 O.O.S.	Y	Y	Y	Y
1.25	5L94 AND 5L96 O.O.S.	Y	Y	Y	Y
1.26	2L112 O.O.S.	Y	Y	Y	Y
1.27	2L293 O.O.S.	Y	Y	Y	Y
1.28	2L294 O.O.S.	Y	Y	Y	Y
1.29	2L277 O.O.S.	Y	Y	Y	Y
1.30	5L40 or 5L41 O.O.S.	Y	Y	Y	Y
1.31	5L42 O.O.S.	Y	Y	Y	Y
1.32	5L44 O.O.S.	Y	Y	Y	Y
1.33	5L45 O.O.S.	Y	Y	Y	Y
1.34	GUI 5CX1 O.O.S.	Y	Y	Y	Y
1.35	AMC 5CX1 O.O.S.	Y	Y	Y	Y
1.36	AMC 5CX2 O.O.S.	Y	Y	Y	Y
1.37	CHP 5CX1 O.O.S.	Y	Y	Y	Y
1.38	CRX 5CX1 O.O.S.	Y	Y	Y	Y
1.39	RYC 5CX1 O.O.S.	Y	Y	Y	Y
1.40	VAS T1 or T2 O.O.S.	Y	Y	Y	Y
1.41	VAS T1 & T2 O.O.S.	Y	Y	Y	Y
1.42	FBC's 75L or 76L O.O.S.	Y	Y	Y	Y
1.43	2L20 or 2L44 O.O.S.	Y	Y	Y	Y
1.44	2L22 or 2L27 O.O.S.	Y	Y	Y	Y
1.45	2L64 O.O.S	Y	Y	Y	Y

Notes: "Y" - The condition is operable and covered by the table.

Table 2 Series Listing:

Table No.	Table Name	VAS-WTS AND VAS-VNT Closed	VAS-WTS Open	VAS-VNT Open	VAS-WTS AND VAS-VNT Open
2.1	*(intentionally blank)*				
2.2	5L83 AND 5L71 O.O.S.	Y	Y	Y	Y
2.3	5L83 AND 5L72 O.O.S.	Y	Y	Y	Y
2.4	5L83 AND SYA 5CX1 O.O.S	Y	Y	Y	Y
2.5	5L83 AND SYA 5CX2 O.O.S	Y	Y	Y	Y
2.6	5L83 AND SYA 5CX1 AND SYA 5CX2 O.O.S	Y	Y	Y	Y
2.7	5L83 AND 5L71 AND SYA 5CX2 O.O.S.	Y	Y	Y	Y
2.8	5L83 AND 5L72 AND SYA 5CX1 O.O.S	Y	Y	Y	Y
2.9	5L83 AND 5L71 AND 5L72 O.O.S.	Y	Y	Y	Y
2.10	5L83 AND 5L75 O.O.S	Y	Y	Y	Y
2.11	5L83 AND 5L77 O.O.S.	Y	Y	Y	Y
2.12	5L83 AND 5L76 O.O.S.	Y	Y	Y	Y
2.13	5L83 AND 5L79 O.O.S.	Y	Y	Y	Y
2.14	5L83 AND 5L81 O.O.S.	Y	Y	Y	Y
2.15	5L83 AND 5L82 O.O.S.	Y	Y	Y	Y
2.16	*(Intentionally blank)*				
2.17	5L83 AND 5L87 O.O.S.	Y	Y	Y	Y
2.18	5L83 AND 5L87 AND (5L71 or 5L72) O.O.S.	Y	Y	Y	Y
2.19	5L83 AND 5L91 O.O.S.	Y	Y	Y	Y
2.20	5L83 AND 5L96 O.O.S.	Y	Y	Y	Y
2.21	5L83 AND 5L98 O.O.S	Y	Y	Y	Y
2.22	5L83 AND 5L96 AND 5L98 O.O.S.	Y	Y	Y	Y
2.23	5L83 AND 5L92 O.O.S.	Y	Y	Y	Y
2.24	5L83 AND 5L94 O.O.S.	Y	Y	Y	Y
2.25	5L83 AND 5L94 AND 5L96 O.O.S.	Y	Y	Y	Y
2.26	5L83 AND 2L112 O.O.S.	Y	Y	Y	Y
2.27	5L83 AND 2L293 O.O.S.	Y	Y	Y	Y
2.28	5L83 AND 2L294 O.O.S.	Y	Y	Y	Y
2.29	5L83 AND 2L277 O.O.S.	Y	Y	Y	Y
2.30	5L83 AND (5L40 or 5L41) O.O.S.	Y	Y	Y	Y
2.31	5L83 AND 5L42 O.O.S.	Y	Y	Y	Y
2.32	5L83 AND 5L44 O.O.S.	Y	Y	Y	Y
2.33	5L83 AND 5L45 O.O.S.	Y	Y	Y	Y
2.34	5L83 AND GUI 5CX1 O.O.S.	Y	Y	Y	Y
2.35	5L83 AND AMC 5CX1 O.O.S.	Y	Y	Y	Y
2.36	5L83 AND AMC 5CX2 O.O.S.	Y	Y	Y	Y
2.37	5L83 AND CHP 5CX1 O.O.S.	Y	Y	Y	Y
2.38	5L83 AND CRK 5CX1 O.O.S.	Y	Y	Y	Y
2.39	*(Intentionally blank)*				
2.40	5L83 AND (VAS T1 or T2) O.O.S.	Y	Y	Y	Y
2.41	5L83 AND VAS T1 AND T2 O.O.S.	Y	Y	Y	Y
2.42	5L83 AND (FBC's 75L or 76L) O.O.S.	Y	Y	Y	Y
2.43	5L83 AND (2L20 or 2L44) O.O.S.	Y	Y	Y	Y
2.44	5L83 AND (2L22 or 2L27) O.O.S.	Y	Y	Y	Y

Notes: **"Y" - The condition is operable and covered by the table.**

Table A - Reference Table
Both FBC's VAS-WTS and VAS-VNT Loops Closed AND All SI, NIC/KLY - LM 500 kV Circuits and Series Capacitor Banks In-Service

CONTINGENCY	SHEDDING REQUIREMENTS
5L76 and 5L79	Same as Table D

5L76	ACK 5CB8 in service:
	    Shed at REV: 1.2 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4200) MW if REV Gen <= 2000 MW
	
	ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75)
	    Shed at REV:
	    • 1.10 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 3800) MW if REV Gen <= 2000 MW, or
	    • 1.24 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4320) MW if REV Gen > 2000 MW
	    AND, If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.

5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service.
5L91 and 5L96	• Arm DTT 2L112 RAS • Arm DTT 48L RAS • Shed at KCL/ALH/SEV/WAN/BRX/WAX: 5L91 SEL + 5L96 SEL + 2L112 NLY + 48L KET + Y + Z – 850 MW Y = 0 if AB to BC >= 0 MW, or Y = (BC to AB transfer) if BC to AB > 0 MW Z = 0 if MATL120S_PST230 <= 0 MW, or Z = MATL120S_PST230 if MATL120S_PST230 > 0 MW • If generation shedding is armed, keep a minimum of 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or • Keep a minimum of 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable. • Keep a minimum of 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition. Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.
5L91	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: • 1.28 * (5L91 SEL+5L96 SEL – 1800), or • 3.72 * (2L112 NLY + 0.17 * 5L91 SEL – 400), or • 3.52 * (2L293 SEL + 0.17 * 5L91 SEL – 400), and do not shed WAN for this requirement.

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z – Y), or
	  ➢ 2.37 * (2L112 NLY + 0.24 * (5L96 SEL + Z) – 400), or
	  ➢ 2.37 * (2L112 NLY + BDY Gen + 0.24 * (5L96 SEL + Z) – 1120), or
	  ➢ 3.05 * (2L293 SEL + 0.17 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	
	Y = 2050 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1820 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L is armed, or
	Z = 0 if DTT 48L is not armed

5L98	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.22 * (5L91 SEL + 5L98 VAS – Y), or
	  ➢ 2.86 * (2L112 NLY + 0.18 * 5L98 VAS – 400), or
	  ➢ 3.92 * (2L293 SEL + 0.15 * 5L98 VAS – 400), and do not shed WAN for this requirement.
	Y = 1850 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1760 if none of ACK 5CX1 & 5CX2 is in service

5L96 AND 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z – Y), or
	  ➢ 2.50 * (2L112 NLY + 0.24 * (5L96 SEL + Z) – 400), or
	  ➢ 2.50 * (2L112 NLY + BDY Gen + 0.24 * (5L96 SEL + Z) – 1150), or
	  ➢ 2.93 * (2L293 SEL + 0.18 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	
	Y = 2030 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1850 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L is armed, or
	Z = 0 if DTT 48L is not armed

5L92	(Note: Arming requirements for DTT 5L94, DTT 1L274 and DTT 1L275 are included in SOO 7T-17.)
	
	Arm DTT 2L112 RAS if
	  ➢ (0 < AB to BC <= 100 MW) **AND** (2L293 NLY + 0.70 * 5L92 CBK > 400 MW), or
	  ➢ (AB to BC > 100 MW) **AND** (2L293 NLY + 5L92 CBK – 0.68 * (AB to BC) > 400 MW), or
	  ➢ (0 <= BC to AB <= 100 MW) **AND** (2L293 SEL + 0.87 * 5L92 SEL – 0.2 * (BC to AB) > 400 MW), or
	  ➢ (BC to AB > 100 MW) **AND** (2L293 SEL + 5L92 SEL – 0.7 * (BC to AB) – 0.3 * (armed KCL/SEV/ALH/WAN/BRX/REV/WAX shedding amount for 5L94 contingency) > 400 MW)

5L94	(Note: Arming requirements for DTT 1L274 and DTT 1L275 are included in SOO 7T-17.)
	
	• If (BC to US + BC to AB) > 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: (BC to AB) MW
	• If 700 MW < (BC to US + BC to AB) <= 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: (BC to AB) – 400 MW
	• If generation shedding is armed, keep a minimum of 2 REV, 2 SEV, 1 KCL and 1/3 equivalent SEV units on-line post-shedding, or keep a minimum of 2 REV, 2 SEV and 1 equivalent SEV units on-line post-shedding if the whole KCL is shutdown in pre-contingency condition.
	
	• Arm DTT 2L112 RAS if
	  ➢ 2L112 BDY + 0.3 * (AB to BC) > 400 MW, or
	  ➢ 2L293 NLY + 0.17 * (AB to BC) > 400 MW, or
	  ➢ 2L112 NLY + 0.3 * (BC to AB) – 0.3 * (armed KCL/SEV/ALH/WAN/BRX/REV/WAX shedding amount for 5L94 contingency) > 400 MW, or
	  ➢ 2L293 SEL + 0.17 * (BC to AB) – 0.17 * (armed KCL/SEV/ALH/WAN/BRX/REV/WAX shedding amount for 5L94 contingency) > 400 MW

5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass GUI 5CX1	No shedding required.
Bypass RYC 5CX1	No shedding required.

Table B – Reference Table
FBC's VAS-WTS Loop Open AND All SI, NIC/KLY – LM 500 kV Circuits and Series Capacitor Banks in Service

CONTINGENCY	SHEDDING REQUIREMENTS
5L76 and 5L79	Same as Table D
5L76	Same as Table A
5L79	Same as Table A

5L91 and 5L96	• Arm DTT 2L112 RAS
	  • Shed at KCL/ALH/SEV/WAN/BRX/WAX: 5L91 SEL + 5L96 SEL + 2L112 NLY + Y + Z – 850 MW
	  Y = 0 if AB to BC >= 0 MW, or
	  Y = (BC to AB transfer) if BC to AB > 0 MW
	  Z = 0 if MATL120S_PST230 <= 0 MW, or
	  Z = MATL120S_PST230 if MATL120S_PST230 > 0 MW
	  • If generation shedding is armed, keep a minimum of 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or
	  • Keep a minimum of 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable, or
	  • Keep a minimum of 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.

5L91	Same as Table A

5L96	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25 * (5L91 SEL + 5L96 SEL – Y), or
	  ➢ 2.37 * (2L112 NLY + 0.24 * 5L96 SEL – 400), or
	  ➢ 2.37 * (2L112 NLY + BDY Gen + 0.24 * 5L96 SEL – 1120), or
	  ➢ 3.05 * (2L293 SEL + 0.17 * 5L96 SEL – 400), and do not shed WAN for this requirement.
	  Y = 2050 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1820 if none of ACK 5CX1 & 5CX2 in service.

5L98	Same as Table A
5L96 & 5L98	Same as Table C
5L92	Same as Table A
5L94	Same as Table A
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass GUI 5CX1	No shedding required.
Bypass RYC 5CX1	No shedding required.

Table C – Reference Table
FBC's VAS-VNT Loop Open AND All SI, NIC/KLY – LM 500 kV Circuits and Series Capacitor Banks in Service

CONTINGENCY	SHEDDING REQUIREMENTS

5L76 and 5L79	**BC To AB (MW)** axis (vertical), **2L112 NLY (MW)** axis (horizontal), origin (0 , 0).
	
	Upper-left quadrant:
	Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
	• 1.15 * [(5L76 + 5L79) ACK + 5L98 VAS - 1600]
	
	Upper-right quadrant:
	Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
	(5L76 + 5L79) ACK + Z + 1L214 VNT + 48L KET
	
	Lower-left quadrant:
	GS = 1.25 * [(5L76 + 5L79) ACK + 5L98 VAS -1600]
	
	If GS >1500 and AB to BC > 500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: 1.17 * [(5L76 + 5L79) ACK + 5L98 VAS - Y]– AB to BC
	
	Otherwise,
	• Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS
	
	Lower-right quadrant:
	GS = (5L76 + 5L79) ACK + 1L214 VNT + Z + 48L KET
	
	If GS >1500 and AB to BC > 500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS – AB to BC
	
	Otherwise,
	• Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS
	
	Note:
	Y = 1300 if BCH load > 7500 MW, or
	Y = 1400 if BCH load <= 7500 MW
	Z = 1L209 SAM if 1L209 is not radial, or Z = 0 if 1L209 is radial
	
	IF (5L76+5L79) ACK > 750 MW, then
	• Arm DTT 1L209 except for 1L209 radial connection, and
	• Arm DTT 1L214, and
	• Arm DTT FBC's 48L, and
	• Apply the above generation shedding rules
	The total armed generation amount must be limited to 2500 MW If DTT 5L94 is not armed, or
	(The total armed generation + AB to BC) must be limited to 2500 MW If DTT 5L94 is armed
	
	If generation shedding is armed, then
	• Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
	• Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and
	• Keep a minimum of 1 REV, 1 SEV, 1 KCL and 1/3 equiv. SEV units on-line post-shedding, or keep a minimum of 1 REV, 1 SEV, and 1 equiv. SEV units on-line post-shedding if KCL plant is shutdown in pre-contingency condition.

5L76	Same as Table A
5L79	Same as Table A
5L91 and 5L96	Same as Table A
5L91	Same as Table D
5L96	Same as Table A
5L98	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.17 * (5L91 SEL + 5L98 VAS – Y), or ➢ 2.72 * (2L112 NLY + 0.22 * 5L98 VAS – 400), or ➢ 3.81 * (2L293 SEL + 0.18 * 5L98 VAS – 400), and do not shed WAN for this requirement. Y = 1940 if at least one of ACK 5CX1 & 5CX2 in service, or Y = 1820 if none of ACK 5CX1 & 5CX2 in service
5L96 & 5L98	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: • 1.25 * (5L91 SEL + 5L96 SEL – Y), or • 2.50 * (2L112 NLY + 0.27 * 5L96 SEL – 400), or • 2.50 * (2L112 NLY + BDY Gen + 0.27 * 5L96 SEL – 1155), or • 2.93 * (2L293 SEL + 0.20 * 5L96 SEL – 400), and do not shed WAN for this requirement. Y = 1970 if at least one of ACK 5CX1 & 5CX2 is in service Y = 1800 if none of ACK 5CX1 and 5CX2 is in service
5L92	Same as Table A
5L94	Same as Table A
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass GUI 5CX1	No shedding required.
Bypass RYC 5CX1	No shedding required.

Table D – Reference Table
FBC's VAS-VNT Loop Open AND VAS-WTS Loop Open AND All SI, NIC/KLY – LM 500 kV Circuits and Series Capacitor Banks In Service

CONTINGENCY	SHEDDING REQUIREMENTS
5L76 and 5L79	(see diagram and notes below)

Diagram (quadrant plot):

Vertical axis: BC To AB (MW)
Horizontal axis: 2L112 NLY (MW)
Origin: (0 , 0)

Top-left quadrant:
Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
- $1.15 * [(5L76 + 5L79)\ ACK + 5L98\ VAS - 1600]$

Top-right quadrant:
Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
$(5L76 + 5L79)\ ACK + Z + 1L214\ VNT$

Bottom-left quadrant:
$GS = 1.25 * [\ (5L76 + 5L79)\ ACK + 5L98\ VAS - 1600\ ]$

If GS >1500 and AB to BC > 500 MW, then
- Arm DTT 5L94, and
- Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
- Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
  $1.17 * [(5L76 + 5L79)\ ACK + 5L98\ VAS - Y] - AB\ to\ BC$

Otherwise,
- Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS

Bottom-right quadrant:
$GS = (5L76 + 5L79)\ ACK + 1L214\ VNT + Z$

If GS >1500 and AB to BC > 500 MW, then
- Arm DTT 5L94, and
- Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
- Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS – AB to BC

Otherwise,
- Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS

Note:
Y = 1300 if BCH load > 7500 MW, or
Y = 1400 if BCH load <= 7500 MW
Z = 1L209 SAM if 1L209 is not radial, or
Z = 0 if 1L209 is radial

IF (5L76+5L79) ACK > 750 MW, then
- Arm DTT 1L209 except for 1L209 radial connection, and
- Arm DTT 1L214, and
- Apply the above generation shedding rules
The total armed generation amount must be limited to 2500 MW If DTT 5L94 is not armed, or

(The total armed generation + AB to BC) must be limited to 2500 MW If DTT 5L94 is armed
If generation shedding is armed, then
- Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
- Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and
- Keep a minimum of 1 REV, 1 SEV, 1 KCL and 1/3 equiv. SEV units on-line post-shedding, or keep a minimum of 1 REV, 1 SEV and 1 equiv. SEV units on-line post-shedding if KCL plant is shutdown in pre-contingency condition.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table A
5L79	Same as Table A
5L91 and 5L96	Same as Table B
5L91	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: • $1.16 * (5L91\ SEL + 5L96\ SEL - 1750)$, or • $3.30 * (2L112\ NLY + 0.21 * 5L91\ SEL - 400)$, or • $3.50 * (2L293\ SEL + 0.18 * 5L91\ SEL - 400)$, and do not shed WAN for this requirement.
5L96	Same as Table B
5L98	Same as Table C
5L96 & 5L98	Same as Table C
5L92	Same as Table A
5L94	Same as Table A
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass GUI 5CX1	No shedding required.
Bypass RYC 5CX1	No shedding required.

Table E – Reference Table for 5L71/5L72 (1P, 3P, 1P&1P, 1P&3P) Contingencies
All SI, NIC/KLY – LM 500 kV Circuits and Series Capacitor Banks In Service

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P)	• If MCA 5CB6 and 5CB7 and 5CB9 are in service, shed at MCA: GS = (5L71+5L72) MCA MW – 5L72_Over_Rating • If MCA 5CB6 is O.O.S., arm MCA G5 and G6 for shedding. • If MCA 5CB9 is O.O.S., arm MCA G1 and G2 for shedding. • If MCA 5CB7 is O.O.S., arm MCA G3 and G4 and G5 and G6 for shedding, and keep a minimum of one of MCA (G1, G2) units on-line post-shedding.
5L72 (3P)	• If MCA 5CB6 and 5CB10 and 5CB11 are in service, shed at MCA: GS = (5L71+5L72) MCA MW – 5L71_Over_Rating • If MCA 5CB6 is O.O.S., arm MCA G3 and G4 for shedding. • If MCA 5CB10 is O.O.S., arm MCA G1 and G2 for shedding. • If MCA 5CB11 is O.O.S., arm MCA G3 and G4 and G5 and G6 for shedding, and keep a minimum of one of MCA (G1, G2) units on-line post-shedding.
5L71 (1P)	No generation shedding
5L72 (1P)	No generation shedding
Bypass SYA 5CX1	No generation shedding
Bypass SYA 5CX2	No generation shedding
5L71 (3P) and 5L72 (1P)	Shed at MCA: 1.18 * [(5L71 +5L72) MCA - 1300] MW. • If MCA 5CB6 and 5CB7 and 5CB9 are in service, the armed MCA units for 5L71 (3P) contingency must be selected for arming first for this contingency. If gen shedding is armed, keep a minimum of 2 MCA units online post-shedding. OR • If MCA 5CB6 is O.O.S., MCA G5 and G6 must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2, G3, G4) units online post-shedding. OR • If MCA 5CB9 is O.O.S., MCA G1 and G2 must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G3, G4, G5, G6) unit on-line post-shedding. • If MCA 5CB7 is O.O.S., MCA G3 and G4 and G5 and G6 must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2) units on-line post-shedding
5L71 (1P) and 5L72 (3P)	Shed at MCA: 1.18 * [(5L71 +5L72) MCA - 1300] MW. • If MCA 5CB6 and 5CB10 and 5CB11 are in service, the armed MCA units for 5L72 (3P) contingency must be selected for arming first for this contingency. If gen shedding is armed, keep a minimum of 2 MCA units online post-shedding. OR • If MCA 5CB6 is O.O.S., MCA G3 and G4 must be armed for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2, G5, G6) units online post-shedding. OR • If MCA 5CB10 is O.O.S., MCA G1 and G2 must be armed for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G3, G4, G5, G6) units on-line post-shedding. • If MCA 5CB11 is O.O.S., MCA G3, G4, G5 and G6 must be armed for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2) units on-line post-shedding.
5L71 (1P) and 5L72 (1P)	Shed at MCA: (5L71 +5L72) MCA - 2600 MW
5L71 (3P) and 5L72 (3P)	• Arm all on-line MCA units (including SC units) for shedding. • Arm DTT 60L223.

Table F – Reference Table for 5L75/5L77 (1P, 3P, 1P&3P) Contingencies
All SI, NIC/KLY – LM 500 kV Circuits and Series Capacitor Banks In Service

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding. ACK 5CB5 O.O.S.: (5L75 contingency will trip open 5L76) • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in Table A AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L77 (3P)	If REV 5CB12 is O.O.S., REV G3, G4 and G5 must be selected for shedding.
5L75 (1P)	No generation shedding.
5L77 (1P)	No generation shedding.
5L75 (1P) and 5L77 (3P)	• If REV Gen <= 2000 MW, then shed at REV: 2.0 * (REV Gen – 1500) MW, or • If REV Gen > 2000 MW, shed REV down to 1000 MW AND • If REV 5CB12 is O.O.S., REV G3, G4 and G5 must be selected for shedding.
5L75 (3P) and 5L77 (1P)	ACK 5CB5 in service: • If REV Gen <= 2000 MW, then shed at REV: 2.0 * (REV Gen – 1500) MW, or • If REV Gen > 2000 MW, shed REV down to 1000 MW AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding. ACK 5CB5 O.O.S.: (5L75 (3P) & 5L77 (1P) contingency will trip open 5L76) • If REV Gen <= 2000 MW, then shed at REV: REV Gen – 1000 MW, or • If REV Gen > 2000 MW, then shed at REV: 1.33 * (REV Gen – 1000) MW AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding. If generation shedding is armed, keep a minimum of 1 REV unit on-line post-shedding
5L75 (3P) and 5L77 (3P)	• Arm all on-line REV units (including SC units) for shedding. • Arm DTT 2L253.

Table 1.1 - All SI, NIC/KLY - LM 500 kV Circuits and Series Capacitor Banks In-Service (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
Notes 2 and 3 in Section 2

Generation Shedding Requirements
All SI, NIC/KLY - LM 500 kV Circuits and Series Capacitor Banks In-Service (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Shed at MCA/REV: $GS + 2.72 * M$ Where GS and M are calculated as follows: $GS = Max (0, 2.44 * (5L44 \ MDN + 0.61 * 5L81 \ NIC - 5L44\_Over\_Rating))$ $Y = 2L112 \ NLY + 0.04 * 5L81 \ NIC - 0.15 * GS$ $Z = -2L293 \ NLY + 0.04 * 5L81 \ NIC - 0.14 * GS$ If $Y >$ NLYPST_OL_PickupMW, $M1 = 0.51 * (Y -$ NLYPST_OL_ResetMW$)$, Else $M1 = 0$ If $Z > 2L293OLRAS\_PickupMW$, $M2 = 0.61 * (Z - 2L293OLRAS\_Reset \ MW)$, Else $M2 = 0$ $M = Max (M1, M2)$
5L82	No shedding required.
5L83	No shedding required.
5L87	No shedding required.

5L44	$GS1 = 14.0 * (2L20CSQ + 0.19 * 5L44 \ MDN - 2L20\_Over\_Rating)$
	$GS2 = 35.3 * (2L51COK + 0.081 * 5L44MDN - 2L51COK\_Over\_Rating)$
	$M = MAX (GS1, GS2, 0)$
	$Y = 2L112 \ NLY + 0.04 * 5L44 \ MDN - 0.1 * M$
	$Z = 2L293 \ SEL + 0.035 * 5L44 \ MDN - 0.1 * M$
	
	If $Y >$ NLYPST_OL_PickupMW,
	   $R1 = 0.08 * (Y -$ NLYPST_OL_ResetMW$)$
	   $R3 = 0.03 * (Y -$ NLYPST_OL_ResetMW$)$
	Else
	   $R1 = 0$
	   $R3 = 0$
	
	If $Z > 2L293OLRAS\_PickupMW$,
	   $R2 = 0.10 * (Z - 2L293OLRAS\_ResetMW)$
	   $R4 = 0.04 * (Z - 2L293OLRAS\_ResetMW)$
	Else
	   $R2 = 0$
	   $R4 = 0$
	
	$Ra = MAX (R1, R2)$
	$Rb = MAX (R3, R4)$
	
	Shed at MCA/REV first, and then GMS/PCN the greater of (Note):
	• $D1 * (GS1 + 14.0 * Ra)$
	• $D2 * (GS2 + 35.3 * Rb)$
	
	Where:
	   $D1 = 1.0$ if shedding at MCA/REV, or
	   $D1 = 1.08$ if shedding at GMS/PCN
	   $D2 = 1.0$ if shedding at MCA/REV, or
	   $D2 = 1.3$ if shedding at GMS/PCN
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit,
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation
	
	Note: an example of determining the amount of gen-shedding is as follows. Let's say $(GS1 + 14.0 * Ra) = 500$ MW, $(GS2 + 35.3 * Rb) = 450$ MW. At MCA/REV, there's only 400 MW can be shed. So TSAPM arms 400 MW at MCA/REV first. Then for amount 1 GS at GMS/PCN, TSAPM calculates $1.08 * (500 - 400) = 108$ MW. For amount 2 GS at GMS/PCN, TSAPM calculates $1.3 * (450 - 400) = 65$ MW. Then TSAPM adds up the total amount required at different locations for the two GS amounts, and makes a final calculation. So in this example, the final GS amount $= max(400 + 108, 400 + 65) = 508$ MW.

5L81 and 5L82	G1 = 3.33 * [5L44 MDN + 0.13 * (5L81+5L82) NIC - 5L44_Over_Rating]
	G2 = 3.6 * [5L83 NIC + 0.47 * (5L81+5L82) NIC - 5L83_Over_Rating]
	G3 = 3.26 * [5L87 NIC + 0.42 * (5L81+5L82) NIC - 5L87_Over_Rating]
	G4 = 6.37 * [2L112 NLY + 0.07 * (5L81+5L82) NIC - NLYPST_OL_PickupMW]
	G5 = 6.59 * [2L293 SEL + 0.06 * (5L81+5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first : 0.93 * (GS – AB to BC)
	• Then at SEV/KCL/ALH/WAN/BRX/WAX/GMS/PCN: 1.35 * [0.93*(GS – AB to BC)-the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G3 > 0.
	• Total armed generation shedding must be limited to (2500 – AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
	• Shed at MCA/REV first : GS
	• Then at SEV/KCL/ALH/WAN/BRX/WAX/GMS/PCN: 1.35 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G3 > 0.
	• Total armed generation shedding must be limited to 2500 MW
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 3.35 * [5L44 MDN + 0.11 * (5L81+5L83) NIC - 5L44_Over_rating]
	G2 = 3.9 * [5L82 NIC + 0.44 * (5L81+5L83) NIC - 5L82_Over_rating]
	G3 = 3.22 * [5L87 NIC + 0.43 * (5L81+5L83) NIC - 5L87_Over_rating]
	G4 = 6.52 * [2L112 NLY + 0.07 * (5L81+5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 6.61 * [2L293 SEL + 0.06 * (5L81+5L83) NIC - 2L293_OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.32 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500], then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.32 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 7.1 * [5L42 KLY + 0.27 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G2 = 4.0 * [5L81 NIC + 0.44 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 3.1 * [5L87 NIC + 0.47 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 6.9 * [2L112 NLY + 0.06 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 7.5 * [2L293 SEL + 0.05 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.32 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500], then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.32 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

Table 1.2 – 5L71 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit: 5L72 MCA <= 5L72_Norm_Rating MW
- Notes: 2 and 3 in Section 2
- 5L87 contingency: Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 4800 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
5L71 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L72 (3P) (TSA-PM must treat it as "5L71 (3P) AND 5L72 (3P)" contingency to obtain required RAS functions)	Same as 5L71 (3P) and 5L72 (3P) contingency in Table E
5L72 (1P)	Shed at MCA: (5L71 + 5L72) MCA - 1700 MW.
Bypass SYA 5CX2	Shed MCA down to 1500 MW
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L81 and 5L82	Same gen shedding amount calculation as system normal Table 1.1. • If generation shedding is required AND if NIC 5CB4 is O.O.S., then the armed REV units for shedding for 5L76 contingency shall be selected for shedding first for this contingency.
5L81 and 5L83	Same as system normal Table 1.1.
5L82 and 5L83	Same as system normal Table 1.1.
5L87	No shedding required.
5L44	Same as system normal Table 1.1

Table 1.3 – 5L72 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit: 5L71 MCA <= 5L71_Norm_Rating MW
- Notes: 2 and 3 in Section 2.
- 5L87 contingency: Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 4800 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
5L72 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P) (TSA-PM must treat it as "5L71 (3P) AND 5L72 (3P)" contingency to obtain required RAS functions)	Same as 5L71 (3P) and 5L72 (3P) contingency in Table E
5L71 (1P)	Same as 5L72 (1P) contingency in 5L71 O.O.S. Table 1.2
Bypass SYA 5CX1	Same as Bypass SYA 5CX2 in 5L71 O.O.S. Table 1.2
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L81 and 5L82	Same gen shedding amount calculation as system normal Table 1.1. • If NIC 5CB8 is O.O.S., arm all on-line MCA units (including SC units) for shedding. If shedding at MCA is not enough, then select other plants for shedding. • If generation shedding is required AND if NIC 5CB4 is O.O.S., then the armed REV units for shedding for 5L76 contingency shall be selected first for arming for this contingency.
5L81 and 5L83	Same as system normal Table 1.1.
5L82 and 5L83	Same gen shedding amount calculation as system normal Table 1.1. • If NIC 5CB8 is O.O.S., arm all on-line MCA units (including SC units) for shedding. If shedding at MCA is not enough, then select other plants for shedding.
5L87	Same as 5L71 O.O.S. Table 1.2
5L44	Same as system normal Table 1.1

Table 1.4 – SYA 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2.

Generation Shedding Requirements
SYA 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P)	Same as Table E
5L72 (3P)	If MCA on-line units = 6, shed at MCA: GS = 1.10 * ((5L71 +5L72) MCA – 1960) MW, or If MCA on-line units = 5, shed at MCA: GS = 1.10 * ((5L71 +5L72) MCA – 1870) MW, or If MCA on-line units = 4, shed at MCA: GS = 1.00 * ((5L71 +5L72) MCA – 1850) MW • If MCA 5CB6 and 5CB10 and 5CB11 are in service and if gen shedding is armed, keep a minimum of 2 MCA units on-line post shedding. OR • If MCA 5CB6 is O.O.S., MCA G3 and G4 must be armed for shedding. Regardless of calculated gen shedding required or not, keep a minimum of two of MCA (G1, G2, G5, G6) units on-line post-shedding. OR • If MCA 5CB10 is O.O.S., MCA G1 and G2 must be armed for shedding. Regardless of calculated gen shedding required or not, keep a minimum of two of MCA (G3, G4, G5, G6) units on-line post-shedding. OR • If MCA 5CB11 is O.O.S., MCA G3 and G4 and G5 and G6 must be armed for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2) units on-line post-shedding.
5L71 (1P)	No generation shedding
5L72 (1P)	No generation shedding
Bypass SYA 5CX2	No generation shedding
5L71 (3P) and 5L72 (1P)	Shed at MCA: (5L71 + 5L72) MCA – 1300 MW • If MCA 5CB6 and 5CB7 and 5CB9 are in service, the armed MCA units for 5L71 (3P) contingency must be selected for shedding first. If gen shedding is armed, keep a minimum of 2 MCA unit on-line post-shedding. OR • If MCA 5CB6 is O.O.S., MCA G5 and G6 must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2, G3, G4) units on-line post-shedding. OR • If MCA 5CB9 is O.O.S., MCA G1 and G2 must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G3, G4, G5, G6) units on-line post-shedding. • If MCA 5CB7 is O.O.S., MCA G3 and G4 and G5 and G6 must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2) units on-line post-shedding.
5L71 (1P) and 5L72 (3P)	Shed at MCA: 1.00 * [(5L71 + 5L72) MCA – 750] MW if MCA on-line units = 2, or 1.23 * [(5L71 + 5L72) MCA – 900] MW if MCA on-line units >= 3 • If MCA 5CB6 and 5CB10 and 5CB11 are in service, the armed MCA units for 5L72 (3P) contingency must be selected for shedding first. If gen shedding is armed, keep a minimum of 1 MCA unit on-line post-shedding. OR • If MCA 5CB6 is O.O.S., the armed MCA units for 5L72 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2, G5, G6) units on-line post-shedding. OR • If MCA 5CB10 is O.O.S., the armed MCA units for 5L72 (3) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G3, G4, G5, G6) units on-line post-shedding. • If MCA 5CB11 is O.O.S., the armed MCA units for 5L72 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2) units on-line post-shedding.
5L71 (1P) and 5L72 (1P)	Shed at MCA: (5L71 +5L72) MCA - 2300 MW
5L71 (3P) and 5L72 (3P)	Same as Table E
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L87	Same as system normal Table 1.1
5L44	Same as system normal Table 1.1

Table 1.5 – SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2.

Generation Shedding Requirements
SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P)	If MCA on-line units = 6, shed at MCA: GS = 1.10 * ((5L71 +5L72) MCA – 1960) MW, or If MCA on-line units = 5, shed at MCA: GS = 1.10 * ((5L71 +5L72) MCA – 1870) MW, or If MCA on-line units = 4, shed at MCA: GS = 1.00 * ((5L71 +5L72) MCA – 1850) MW • If MCA 5CB6 and 5CB7 and 5CB9 are in service, and if gen shedding is armed, keep a minimum of 2 MCA units on-line post shedding. OR • If MCA 5CB6 is O.O.S., MCA G5 and G6 must be armed for shedding. Regardless of calculated gen shedding required or not, keep a minimum of two of MCA (G1, G2, G3, G4) units on-line post shedding. OR • If MCA 5CB9 is O.O.S., MCA G1 and G2 must be armed for shedding. Regardless of calculated gen shedding required or not, keep a minimum of two of MCA (G3, G4, G5, G6) units on-line post shedding. OR • If MCA 5CB7 is O.O.S., MCA G3 and G4 and G5 and G6 must be armed for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2) unit on-line post shedding.
5L72 (3P)	Same as Table E
5L71 (1P)	No generation shedding
5L72 (1P)	No generation shedding
Bypass SYA 5CX1	No generation shedding
5L71 (3P) and 5L72 (1P)	Shed at MCA: 1.00 * [(5L71 + 5L72) MCA – 750] MW if MCA on-line units = 2, or 1.23 * [(5L71 + 5L72) MCA – 900] MW if MCA on-line units >= 3 • If MCA 5CB6 and 5CB7 and 5CB9 are in service, the armed MCA units for 5L71 (3P) contingency must be selected for shedding first. If gen shedding is armed, keep a minimum of 1 MCA unit on-line post-shedding. OR • If MCA 5CB6 is O.O.S., the armed MCA units for 5L71 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of gen shedding required or not, keep a minimum of one of MCA (G1, G2, G3, G4) units on-line post-shedding. OR • If MCA 5CB9 is O.O.S., the armed MCA units for 5L71 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of gen shedding required or not, keep a minimum of one of MCA (G3, G4, G5, G6) units on-line post-shedding. • If MCA 5CB7 is O.O.S., the armed MCA units for 5L71 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2) unit on-line post shedding.
5L71 (1P) and 5L72 (3P)	Shed at MCA: (5L71 + 5L72) MCA – 1300 MW • If MCA 5CB6 and 5CB10 and 5CB11 are in service, the armed MCA units for 5L72 (3P) contingency must be selected for shedding first. If gen shedding is armed, keep a minimum of 2 MCA units on-line post-shedding. OR • If MCA 5CB6 is O.O.S., MCA G3 and G4 must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of gen shedding required or not, keep a minimum of one of MCA (G1, G2, G5, G6) units on-line post-shedding. OR • If MCA 5CB10 is O.O.S., MCA G1 and G2 must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of gen shedding required or not, keep a minimum of one of MCA (G3, G4, G5, G6) units on-line post-shedding. • If MCA 5CB11 is O.O.S., MCA G3, G4, G5 and G6 must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of gen shedding required or not, keep a minimum of one of MCA (G1, G2) units on-line post-shedding.
5L71 (1P) and 5L72 (1P)	Same as SYA 5CX1 O.O.S. Table 1.4
5L71 (3P) and 5L72 (3P)	Same as Table E
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L87	Same as system normal Table 1.1
5L44	Same as system normal Table 1.1

Table 1.6 – SYA 5CX1 AND SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2.

Generation Shedding Requirements
SYA 5CX1 AND SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P)	Same as SYA 5CX2 O.O.S Table 1.5
5L72 (3P)	Same as SYA 5CX1 O.O.S Table 1.4
5L71 (1P)	No generation shedding
5L72 (1P)	No generation shedding
5L71 (3P) and 5L72 (1P)	Shed at MCA: $1.00 * [(5L71 + 5L72) MCA - 800]$ MW if MCA on-line units = 2, or $1.23 * [(5L71 + 5L72) MCA - 910]$ MW if MCA on-line units >= 3 • If MCA 5CB6 and 5CB7 and 5CB9 are in service, the armed MCA units for 5L71 (3P) contingency must be selected for shedding first. If gen shedding is armed, keep a minimum of 1 MCA unit on-line post-shedding. OR • If MCA 5CB6 is O.O.S., the armed MCA units for 5L71 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of gen shedding required or not, keep a minimum of one of MCA (G1, G2, G3, G4) units on-line post-shedding. OR • If MCA 5CB9 is O.O.S., the armed MCA units for 5L71 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of gen shedding required or not, keep a minimum of one of MCA (G3, G4, G5, G6) units on-line post-shedding. • If MCA 5CB7 is O.O.S., the armed MCA units for 5L71 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2) unit on-line post shedding.
5L71 (1P) and 5L72 (3P)	Shed at MCA: $1.00 * [(5L71 + 5L72) MCA - 800]$ MW if MCA on-line units = 2, or $1.23 * [(5L71 + 5L72) MCA - 910]$ MW if MCA on-line units >= 3 • If MCA 5CB6 and 5CB10 and 5CB11 are in service, the armed MCA units for 5L72 (3P) contingency must be selected for shedding first. If gen shedding is armed, keep a minimum of 1 MCA unit on-line post-shedding. OR • If MCA 5CB6 is O.O.S., the armed MCA units for 5L72 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2, G5, G6) units on-line post-shedding. OR • If MCA 5CB10 is O.O.S., the armed MCA units for 5L72 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G3, G4, G5, G6) units on-line post-shedding. • If MCA 5CB11 is O.O.S., the armed MCA units for 5L72 (3P) contingency must be armed for shedding. If not enough, then select the remaining MCA units for shedding. Regardless of calculated gen shedding required or not, keep a minimum of one of MCA (G1, G2) units on-line post-shedding.
5L71 (1P) and 5L72 (1P)	Shed at MCA: $(5L71 + 5L72) MCA - 1800$ MW
5L71 (3P) and 5L72 (3P)	Same as Table E
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L87	Same as system normal Table 1.1
5L44	Same as system normal Table 1.1

Table 1.7 – 5L71 AND SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2.
- MCA MW output limit:
  The lesser of:
    - 1950 MW (voltage stability limit), or
    - 5L72_Norm_Rating
- 5L87 Contingency: Limit 2.6 * (5L71 + 5L72) MCA + [(5L76 + 5L79) ACK + 5L98 VAS] < 6750 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
5L71 AND SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L72 (3P) (TSA-PM must treat it as "5L71 (3P) AND 5L72 (3P)" contingency to obtain required RAS functions)	Same as 5L71 (3P) and 5L72 (3P) contingency in Table E
5L72 (1P)	Shed MCA down to 1041 MW
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L81 and 5L82	Same as 5L71 O.O.S. Table 1.2
5L81 and 5L83	Same as 5L71 O.O.S. Table 1.2
5L82 and 5L83	Same as system normal Table 1.1
5L87	No shedding required.
5L44	Same as system normal Table 1.1

Table 1.8 – 5L72 AND SYA 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2.
- MCA MW output limit:
  The lesser of:
    - 1950 MW (voltage stability limit), or
    - 5L71_Norm_Rating
- 5L87 Contingency: Limit 2.6 * (5L71 + 5L72) MCA + [(5L76 + 5L79) ACK + 5L98 VAS] < 6750 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
5L72 AND SYA 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P) (TSA-PM must treat it as "5L71 (3P) AND 5L72 (3P)" contingency to obtain required RAS functions)	Same as 5L71 (3P) and 5L72 (3P) contingency in Table E.
5L71 (1P)	Same as 5L72 (1P) contingency in Table 1.7 – 5L71 AND SYA 5CX2 O.O.S.
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1.
5L83	Same as system normal Table 1.1
5L81 and 5L82	Same as 5L72 O.O.S. Table 1.3
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as 5L72 O.O.S. Table 1.3
5L87	Same as 5L71 AND SYA 5CX2 O.O.S. Table 1.7
5L44	Same as system normal Table 1.1

Table 1.9 – 5L71 and 5L72 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:

- Notes 2 and 3 in Section 2.
- This table is applicable to BCH load <= 8500 MW. Both 5L71 and 5L72 O.O.S. should be avoided when BCH load > 8500 MW. If the outage cannot be avoided, special studies are required.
- For restrictions of NIC 500 kV reactors, refer to Section 8.3.8 in SOO 7T-18.

Generation Shedding Requirements:
5L71 and 5L72 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table F is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table A
5L79	Same as Table A
5L81	Same as system normal Table 1.1, except for no Minimum Unit On-Line Post-shedding requirement at MCA.
5L82	Same as system normal Table 1.1, except for no Minimum Unit On-Line Post-shedding requirement at MCA.
5L83	Same as system normal Table 1.1, except for no Minimum Unit On-Line Post-shedding requirement at MCA.
Bypass AMC 5CX1	No shedding required
Bypass AMC 5CX2	No shedding required
Bypass RYC 5CX1	No shedding required

5L81 and 5L82	Same as system normal Table 1.1, except that the following Minimum Unit On-Line Post-shedding requirements shall be applied.
	
	If generation shedding is armed,
	➢ keep a minimum of 2 REV, 2 SEV and 1 KCL (with high side 2CBs in service) units on-line post-shed if SEL 5RX3 is available, or
	➢ keep a minimum of 2 REV, 2 SEV, 1 KLC (with high side 2CBs in service) and 1 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable, or
	➢ keep a minimum of 2 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or
	➢ keep a minimum of 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	The gen-shedding requirements at KCL for preventing KCL 230 kV main buses electrically disconnected post-shedding, and the requirement at WAN, ALH, BRX and WAX as specified in Note 1 in Section 3 are applicable to here.
	
	If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", "C5L81_83 - MAX ARMED SHED VIOLATION", or "C5L82_83 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	➢ If BC is exporting to US, then reduce BC to US export.
	➢ If BC is importing from US, then
	    • reduce (SI and FBC) generation and increase Peace generation, or/and
	    • reduce (SI and FBC) generation and increase import from US

5L81 and 5L83	Same as system normal Table 1.1 except that the Minimum Unit On-Line Post-shedding requirements for 5L81 and 5L82 contingency in this table shall be applied.
5L82 and 5L83	Same as system normal Table 1.1 except that the Minimum Unit On-Line Post-shedding requirements for 5L81 and 5L82 contingency in this table shall be applied.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76 and 5L79	

<div style="text-align:center">

BC To AB
(MW)

Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
- $1.15 * [(5L76 + 5L79)$ ACK $+ 5L98$ VAS $- 1500]$

Shed at REV first, then
KCL/ALH/SEV/WAN/BRX/WAX:
  $(5L76 + 5L79)$ ACK $+ Z + 1L214$ VNT $+ W$

$(0 , 0)$ 2L112 NLY (MW)

</div>

$GS = 1.25 * [(5L76 + 5L79)$ ACK $+ 5L98$ VAS $- 1600]$

If GS >1500 and AB to BC > 500 MW, then
- Arm DTT 5L94, and
- Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
- Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
  $1.17 * [(5L76 + 5L79)$ ACK $+ 5L98$ VAS $– Y] - $ AB to BC

Otherwise,
- Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS

$GS = (5L76 + 5L79)$ ACK $+ 1L214$ VNT $+ Z + W$

If GS >1500 and AB to BC > 500 MW, then
- Arm DTT 5L94, and
- Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
- Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS – AB to BC

Otherwise,
- Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS

Note:
Y = 1300 if BCH load > 7500 MW, or
Y = 1400 if BCH load <= 7500 MW
Z = 1L209 SAM if 1L209 is not radial, or Z = 0 if 1L209 is radial
W = 48L KET if DTT 48L RAS is armed, otherwise, W = 0.

IF $(5L76+5L79)$ ACK > 750 MW, then
- Arm DTT 1L209 except for 1L209 radial connection, and
- Arm DTT 1L214, and
- Arm DTT FBC's 48L if VAS-VNT loop is open and VAS-WTS loop is closed, and
- Apply the above generation shedding rules
The total armed generation amount must be limited to 2500 MW If DTT 5L94 is not armed, or
(The total armed generation + AB to BC) must be limited to 2500 MW If DTT 5L94 is armed

If generation shedding is armed, then
- Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
- Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and
- Keep a minimum of 1 REV, 1 SEV, 1 KCL and 1/3 equiv. SEV units on-line post-shedding or keep a minimum of 1 REV, 1 SEV and 1 equiv. SEV units on-line post-shedding if the whole KCL plant is shutdown in pre-contingency condition.

CONTINGENCY	SHEDDING REQUIREMENTS
5L87	No generation shedding
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as system normal Table 1.1 except for no shedding at MCA and no Minimum Unit On-Line Post-shedding requirement at MCA.
5L91	Tables A, B, C and D are applicable to this contingency
5L96	Tables A, B, C and D are applicable to this contingency
5L98	<u>Both VAS-WTS and VAS-VNT loops closed, or VAS-WTS loop open and VAS-VNT loop closed</u> • Same as Tables A <u>Both VAS-WTS and VAS-VNT loops open, or VAS-VNT loop open and VAS-WTS loop closed</u> • Same as Tables C
5L96 & 5L98	<u>Both VAS-WTS and VAS-VNT loops closed</u> • Same as Tables A <u>VAS-WTS loop open, or VAS-VNT loop open, or both VAS-WTS and VAS-VNT loops open</u> • Same as Tables C
5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No generation shedding
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No generation shedding

Table 1.10 – 5L75 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit: 5L77 REV <= 5L77_Norm_Rating MW
- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
Note: Tables A, B, C, D and E are applicable to this Table, except for single contingencies 5L76, 5L79 as indicated in this table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L77 (3P) (TSA-PM must treat it as "5L75 (3P) and 5L77 (3P)" contingency to obtain required RAS functions)	Same as 5L75 (3P) and 5L77 (3P) contingency in Table F.
5L77 (1P)	Shed at REV: REV Gen - 2000 MW
5L76	Shed at REV: 1.03 * (5L77 REV + (5L91 + 5L96) SEL – 4000) MW if REV Gen <= 2000 MW
5L79	Same gen shedding as 5L76 contingency.
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L87	Same as system normal Table 1.1
5L44	Same as system normal Table 1.1

Table 1.11 – 5L77 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

    Pre-Outage Restrictions
- Limit: 5L75 REV <= 5L75_Norm_Rating MW
- Notes: 2 and 3 in Section 2.

    Generation Shedding Requirements
        Note: Tables A, B, C, D and E are applicable to this Table, except for single contingencies 5L76, 5L79 as indicated in this table

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P) (TSA-PM must treat it as "5L75 (3P) and 5L77 (3P)" contingency to obtain required RAS functions)	Same as 5L75 (3P) and 5L77 (3P) contingency in Table F.
5L75 (1P)	Shed at REV: REV Gen - 2000 MW
5L76	ACK 5CB8 in service: Shed at REV: 1.03 * (5L75 REV + (5L91 + 5L96) SEL – 4000) MW if REV Gen <= 2000 MW ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75) Shed REV down to 0 MW.
5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service.
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L87	Same as system normal Table 1.1
5L44	Same as system normal Table 1.1

Table 1.12 – 5L76 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
Notes 2 and 3 in Section 2.

Generation Shedding Requirements
5L76 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as ACK 5CB5 in service in Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required
Bypass AMC 5CX2	No shedding required
Bypass RYC 5CX1	No shedding required
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L79	Tables A, B, C and D for contingency 5L76 AND 5L79 are applicable to this contingency
5L87	Same as system normal Table 1.1.
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as system normal Table 1.1
5L91	Tables A, B, C and D are applicable to this contingency
5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 2.20 * (5L79 ACK + 0.60 * (5L96 SEL + Z) – 5L79_Over_Rating) ➢ 1.25 * (5L79 ACK + 5L96 SEL + Z – Y), or ➢ 2.45 * (2L112 NLY + 0.25 * (5L96 SEL + Z) – 400), or ➢ 2.45 * (2L112 NLY + BDY Gen + 0.25 * (5L96 SEL + Z) – 1170), or ➢ 3.10 * (2L293 SEL + 0.19 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement Y = Min (3050, 1800 + 0.60 * REV MW) if at least one of ACK 5CX1 & 5CX2 is in service, or Y = Min (2790, 1500 + 0.60 * REV MW) if none of ACK 5CX1 & 5CX2 is in service Z = 48L KET if DTT 48L is armed, or Z = 0 if DTT 48L is not armed
5L98	If VAS-VNT loop is closed, then • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.94 * (5L79 ACK + 0.77 * 5L98 VAS – 5L79_Over_Rating) ➢ 1.73 * (5L79 ACK + 5L98 VAS – Y), or ➢ 2.71 * (2L112 NLY + 0.21 * 5L98 VAS – 400), or ➢ 2.71 * (2L112 NLY + BDY Gen + 0.21 * 5L98 VAS – 1200), or ➢ 3.75 * (2L293 SEL + 0.17 * 5L98 VAS – 400), and do not shed WAN for this requirement Y = (1700 + 0.56 * REV MW) if at least one of ACK 5CX1 & 5CX2 is in service, or Y = (1500 + 0.56 * REV MW) if none of ACK 5CX1 & 5CX2 is in service. Otherwise, Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.94 * (5L79 ACK + 0.77 * 5L98 VAS – 5L79_Over_Rating) ➢ 1.70 * (5L79 ACK + 5L98 VAS – Y), or ➢ 2.60 * (2L112 NLY + 0.25 * 5L98 VAS – 400), or ➢ 2.60 * (2L112 NLY + BDY Gen + 0.25 * 5L98 VAS – 1200), or ➢ 3.60 * (2L293 SEL + 0.20 * 5L98 VAS – 400), and do not shed WAN for this requirement Y = Min (2950, 1560 + 0.60 * REV MW) if at least one of ACK 5CX1 & 5CX2 is in service, or Y = Min (2750, 1360 + 0.60 * REV MW) if none of ACK 5CX1 & 5CX2 is in service
5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed. • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 2.20 * (5L79 ACK + 0.64 * (5L96 SEL + Z) – 5L79_Over_Rating) ➢ 1.25 * (5L79 ACK + 5L96 SEL + Z – Y), or ➢ 2.44 * (2L112 NLY + 0.24 * (5L96 SEL + Z) – 400), or ➢ 2.44 * (2L112 NLY + BDY Gen + 0.24 * (5L96 SEL + Z) – 1350), or ➢ 2.56 * (2L293 SEL + 0.18 * 5L96 SEL – 400), and do not shed WAN for this requirement Y = Min (2970, 1570 + 0.64 * REV MW) if at least one of ACK 5CX1 & 5CX2 is in service, or Y = Min (2770, 1370 + 0.64 * REV MW) if none of ACK 5CX1 & 5CX2 is in service Z = 48L KET if DTT 48L is armed, or Z = 0 if DTT 48L is not armed
5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.13 – 5L79 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit: 5L76 ACK <= 5L76_Norm_Rating MW
- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
5L79 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F. ACK 5CB5 O.O.S.: (5L75 contingency will trip open 5L76) No gen shedding. (note: The gen shedding for 5L76 contingency in this table has covered this contingency)
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S.: (5L75 (3P) & 5L77 (1P) contingency will trip open 5L76) • Shed REV down to 500 MW. AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding. If generation shedding is armed, keep a minimum of 1 REV unit on-line post-shedding, which should be the same REV unit as for 5L76 contingency in this table.
5L75 (3P) and 5L77 (3P)	Same as Table F
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required
Bypass AMC 5CX2	No shedding required
Bypass RYC 5CX1	No shedding required
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L76	Tables A, B, C and D for contingency 5L76 AND 5L79 are applicable to this contingency.
5L87	Same as 5L76 O.O.S. Table 1.12
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as system normal Table 1.1
5L91	Tables A, B, C and D are applicable to this contingency

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ $2.20 * (5L76\ ACK + 0.60 * (5L96\ SEL + Z) - 5L76\_Over\_Rating)$
	  ➢ $1.25 * (5L76\ ACK + 5L96\ SEL + Z - Y)$, or
	  ➢ $2.45 * (2L112\ NLY + 0.25 * (5L96\ SEL + Z) - 400)$, or
	  ➢ $2.45 * (2L112\ NLY + BDY\ Gen + 0.25 * (5L96\ SEL + Z) - 1170)$, or
	  ➢ $3.10 * (2L293\ SEL + 0.19 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement
	  $Y = Min (3050, 1800 + 0.60 * REV\ MW)$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	  $Y = Min (2790, 1500 + 0.60 * REV\ MW)$ if none of ACK 5CX1 & 5CX2 is in service.
	  $Z = 48L\ KET$ if DTT 48L is armed, or
	  $Z = 0$ if DTT 48L is not armed
	• If TSA-PM alarms "VIOLATION_5L76_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to bring the flow on 5L76 ACK below the rating within 30 minutes:
	  • Reduce REV or SIE generation, or
	  • Reduce flow on 2L112 from BDY to NLY, or
	  • Reduce import from Alberta

5L98	If VAS-VNT loop is closed, then
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ $1.94 * (5L76\ ACK + 0.77 * 5L98\ VAS - 5L76\_Over\_Rating)$
	  ➢ $1.73 * (5L76\ ACK + 5L98\ VAS - Y)$, or
	  ➢ $2.71 * (2L112\ NLY + 0.21 * 5L98\ VAS - 400)$, or
	  ➢ $2.71 * (2L112\ NLY + BDY\ Gen + 0.21 * 5L98\ VAS - 1200)$, or
	  ➢ $3.75 * (2L293\ SEL + 0.17 * 5L98\ VAS - 400)$, and do not shed WAN for this requirement
	  $Y = (1750 + 0.56 * REV\ MW)$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	  $Y = (1500 + 0.56 * REV\ MW)$ if none of ACK 5CX1 & 5CX2 is in service.
	Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ $1.94 * (5L76\ ACK + 0.77 * 5L98\ VAS - 5L76\_Over\_Rating)$
	  ➢ $1.70 * (5L76\ ACK + 5L98\ VAS - Y)$, or
	  ➢ $2.60 * (2L112\ NLY + 0.25 * 5L98\ VAS - 400)$, or
	  ➢ $2.60 * (2L112\ NLY + BDY\ Gen + 0.25 * 5L98\ VAS - 1200)$, or
	  ➢ $3.60 * (2L293\ SEL + 0.20 * 5L98\ VAS - 400)$, and do not shed WAN for this requirement
	  $Y = Min (2950, 1560 + 0.60 * REV\ MW)$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	  $Y = Min (2750, 1360 + 0.60 * REV\ MW)$ if none of ACK 5CX1 & 5CX2 is in service
	• If TSA-PM alarms "VIOLATION_5L76_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to bring the flow on 5L76 ACK below the rating within 30 minutes:
	  ➢ Reduce REV or SIE generation, or
	  ➢ Reduce flow on 2L112 from BDY to NLY, or
	  ➢ Reduce import from Alberta

CONTINGENCY	SHEDDING REQUIREMENTS

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at KCL/ALH/WAN/BRX first/WAX, then SEV the greatest of:
	  ➢ $2.20 * (5L76\ ACK + 0.64 * (5L96\ SEL + Z) - 5L76\_Over\_Rating)$
	  ➢ $1.25 * (5L76\ ACK + 5L96\ SEL + Z - Y)$, or
	  ➢ $2.44 * (2L112\ NLY + 0.24 * (5L96\ SEL + Z) - 400)$, or
	  ➢ $2.44 * (2L112\ NLY + BDY\ Gen + 0.24 * (5L96\ SEL + Z) - 1350)$, or
	  ➢ $2.56 * (2L293\ SEL + 0.18 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement
	    Y = Min (2970, 1570 + 0.64 * REV MW) if at least one of ACK 5CX1 & 5CX2 is in service, or
	    Y = Min (2770, 1370 + 0.64 * REV MW) if none of ACK 5CX1 & 5CX2 is in service
	    Z = 48L KET if DTT 48L is armed, or
	    Z = 0 if DTT 48L is not armed
	• If TSA-PM alarms "VIOLATION_5L76_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to bring the flow on 5L76 ACK below the rating within 30 minutes:
	  ➢ Reduce REV or SIE generation, or
	  ➢ Reduce flow on 2L112 from BDY to NLY, or
	  ➢ Reduce import from Alberta

5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.14 – 5L81 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2
- 5L87 contingency:
  Limit (5L82 + 5L83 + 5L87) NIC < 4300 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.
- 2L20 contingency:

  Limit: 5L44 MDN + 0.11 * 2L20 CSQ <= 5L44_Over_Rating
  If TSA-PM alarms "VIOLATION_5L44 MDN OVER RATING_2L20CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 ARN, or
  - Reduce generation in SI and increase generation in Peace or North Coast Area, or
  - Reduce export to US on 5L51 and 5L52.
- 2L22 contingency:

  Limit: 5L44 MDN + 0.41 * 2L22 MDN <= 5L44_Over_Rating
  If TSA-PM alarms "VIOLATION_5L44 MDN OVER RATING_2L22CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 ARN, or
  - Reduce generation in SI and increase generation in Peace or North Coast Area, or
  - Reduce export to US on 5L51 and 5L52.
- 2L129 contingency:

  Limit: 5L44 MDN + 0.58 * 2L129 VIT <= 5L44_Over_Rating
  If TSA-PM alarms "VIOLATION_5L44 MDN OVER RATING_2L129CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 VIT, or
  - Reduce generation in SI and increase generation in Peace or North Coast Area, or
  - Reduce export to US on 5L51 and 5L52.

Generation Shedding Requirements
5L81 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS

5L76	ACK 5CB8 in service: No Generation shedding
	
	ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75)
	    If REV Gen <= 2000 MW, shed at REV: 1.05 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4040) MW
	AND
	    If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.

5L79	No Generation shedding.

5L82
(TSA-PM must treat it as "5L81 AND 5L82" contingency to obtain required RAS functions)
	G1 = 3.35 * [5L83 NIC + 0.5 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G2 = 3.24 * [5L87 NIC + 0.41 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	G3 = 6.56 * [2L112 NLY + 0.06 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G4 = 6.97 * [2L293 SEL + 0.05 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first : 0.93 * (GS – AB to BC)
	• Then at SEV/KCL/ALH/WAN/BRX/WAX/GMS/PCN: 1.31 * [0.93 * (GS – AB to BC)-the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G2 > 0.
	• Total armed generation shedding must be limited to (2500 – AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
	• Shed at MCA/REV first : GS
	• Then at SEV/KCL/ALH/WAN/BRX/WAX/GMS/PCN: 1.31 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G2 > 0.
	• Total armed generation shedding must be limited to 2500 MW
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.
	(Note: Note 10 in Section 3 is applicable to this contingency)

5L83
(TSA-PM must treat it as "5L81 AND 5L83" contingency to obtain required RAS functions)
	G1 = 3.52 * [5L82 NIC + 0.47 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G2= 3.12 * [5L87 NIC + 0.42 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G3 = 6.68 * [2L112 NLY + 0.06 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G4 = 7.18 * [2L293 SEL + 0.05 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.37 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G2 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.37 * (GS – the armed gen-shedding amount at MCA/REV). If G2 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 4.0 * [5L41 KLY + 0.44 * (5L82 + 5L83) NIC - 5L41_Over_Rating]
	G2 = 5.3 * [5L42 KLY + 0.44 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G3 = 1.7 * [5L87 NIC + 0.83 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 5.8 * [2L112 NLY + 0.11 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 6.3 * [2L293 SEL + 0.10 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.36 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	    If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500], then
	      • Shed at MCA/REV: GS
	      • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.36 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	      • Total armed generation shedding must be limited to 2500 MW.
	
	    If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

Bypass AMC 5CX2	No shedding required
Bypass RYC 5CX1	No shedding required
5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L87	Shed at REV/MCA: 2.4 * (0.22 * 5L87 NIC + 5L44 MDN + 50 – 5L44_Over_Rating)
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency

5L44	GS1 = 3.5 * (5L41KLY + 0.38 * 5L44MDN – 5L41_Over_Rating)
	GS2 = 10 * (2L20CSQ + 0.23 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 26 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.08 * 5L44 MDN – 0.17* M
	Z = 2L293 SEL + 0.07 * 5L44 MDN – 0.15 * M
	
	If Y > NLYPST_OL_PickupMW,
	R1 = 0.36 * (Y - NLYPST_OL_ResetMW)
	R3 = 0.08 * (Y - NLYPST_OL_ResetMW)
	R5 = 0.03 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	R2 = 0.44 * (Z - 2L293OLRAS_ResetMW)
	R4 = 0.10 * (Z - 2L293OLRAS_ResetMW)
	R6 = 0.03 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	    Shed at MCA/REV first, and then GMS/PCN the greatest of:
	D1 * (GS1 + 3.5* Ra)
	D2 * (GS2 + 10* Rb)
	D3 * (GS3 + 26* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 0.75 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.1 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN,
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	    Reduce the flow on 2L129 from ARN to VIT.
	    Reduce SI generation and increase Peace generation

5L91	Tables A, B, C and D are applicable to this contingency

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z – Y), or
	  ➢ 2.59 * (2L112 NLY + 0.22 * (5L96 SEL + Z) – 400), or
	  ➢ 2.59 * (2L112 NLY + BDY Gen + 0.22 * (5L96 SEL + Z) – 1180), or
	  ➢ 3.34 * (2L293 SEL + 0.16 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	  Y = 2200 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1900 if none of ACK 5CX1 & 5CX2 is in service AND all SEL T1 & T2 & T4 are in service
	  Z = 48L KET if DTT 48L is armed, or
	  Z = 0 if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.86 * (5L91 SEL + 5L98 VAS − Y), or
	  ➢ 2.78 * (2L112 NLY + 0.18 * 5L98 VAS − 400), or
	  ➢ 3.82 * (2L293 SEL + 0.15 * 5L98 VAS − 400), and do not shed WAN for this requirement.
	Y = 1910 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1800 if none of ACK 5CX1 & 5CX2 is in service
	Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.86 * (5L91 SEL + 5L98 VAS − Y), or
	  ➢ 2.68 * (2L112 NLY + 0.21 * 5L98 VAS − 400), or
	  ➢ 3.69 * (2L293 SEL + 0.17 * 5L98 VAS − 400), and do not shed WAN for this requirement.
	Y = 1950 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1770 if none of ACK 5CX1 & 5CX2 is in service

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z − Y), or
	  ➢ 2.88 * (2L112 NLY + 0.25 * (5L96 SEL + Z) − 400), or
	  ➢ 2.88 * (2L112 NLY + BDY Gen + 0.25 * (5L96 SEL + Z) − 1160) or
	  ➢ 3.24 * (2L293 SEL + 0.19 * (5L96 SEL + Z) − 400), and do not shed WAN for this requirement.
	Y = 2170 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1830 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L is armed, or
	Z = 0 if DTT 48L is not armed

5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.15 – 5L82 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2
- 5L87 contingency:
  Limit (5L81 + 5L83 + 5L87) NIC < 4300 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
5L82 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table 1.14 – 5L81 O.O.S.
5L79	No Generation shedding.

5L81
(TSA-PM must treat it as "5L81 AND 5L82" contingency to obtain required RAS functions)
	G1 = 3.35 * [5L83 NIC + 0.45 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G2 = 3.15 * [5L87 NIC + 0.45 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	G3 = 6.66 * [2L112 NLY + 0.07 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G4 = 7.04 * [2L293 SEL + 0.06 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first : 0.93 * (GS – AB to BC)
	• Then at SEV/KCL/ALH/WAN/BRX/WAX/GMS/PCN: 1.32 * [0.93*(GS – AB to BC)-the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G2 > 0.
	• Total armed generation shedding must be limited to (2500 – AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
	• Shed at MCA/REV first : GS
	• Then at SEV/KCL/ALH/WAN/BRX/WAX/GMS/PCN: 1.32 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G2 > 0.
	• Total armed generation shedding must be limited to 2500 MW
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.
	
	(Note: Note 9 in Section 3 is applicable to this contingency)

5L83
(TSA-PM must treat it as "5L82 AND 5L83" contingency to obtain required RAS functions)
	G1 = 6.9 * [5L42 KLY + 0.27 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G2 = 3.4 * [5L81 NIC + 0.44 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 3.0 * [5L87 NIC + 0.47 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 7.3 * [2L112 NLY + 0.05 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 7.8 * [2L293 SEL + 0.05 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.37 *[0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS/PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	• Shed at MCA/REV: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.37 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 5.03 * [5L41 KLY + 0.31 * (5L81 + 5L83) NIC - 5L41_Over_Rating]
	G2 = 4.21 * [5L42 KLY + 0.39 * (5L81 + 5L83) NIC - 5L42_Over_Rating]
	G3 = 1.79 * [5L87 NIC + 0.81 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 4.99 * [2L112 NLY + 0.13 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW)]
	G5 = 5.27 * [2L293 SEL + 0.12 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW)]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.30 *[0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS/PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500], then
	• Shed at MCA/REV: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.30 * (GS– the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

Bypass AMC 5CX1	No shedding required
Bypass RYC 5CX1	No shedding required

5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L87	Shed at REV/MCA: 1.1 * [(5L81 + 5L83 + 5L87) NIC – 4400] MW
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency

5L44	GS1 = 3.5 * (5L81NIC + 0.3 * 5L44MDN – 5L81_ Over_Rating)
	GS2 = 14.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 39.5* (2L51COK + 0.1 * 5L44MDN - 2L51COK_ Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.04 * 5L44 MDN – 0.13* M
	Z = 2L293 SEL + 0.04 * 5L44 MDN – 0.11 * M
	
	If Y > NLYPST_OL_ PickupMW,
	    R1 = 0.38 * (Y - NLYPST_OL_ResetMW)
	    R3 = 0.08 * (Y - NLYPST_OL_ResetMW)
	    R5 = 0.03 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	    R2 = 0.45 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	    R6 = 0.035 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	    • Shed at MCA/REV first, and then GMS/PCN the greatest of:
	      ➢ D1 * (GS1 + 3.5* Ra)
	      ➢ D2 * (GS2 + 14.5* Rb)
	      ➢ D3 * (GS3 + 39.5* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.6 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.0 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.15 if shedding at GMS/PCN,
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	    • Reduce the flow on 2L129 from ARN to VIT.
	    • Reduce SI generation and increase Peace generation

5L91	Tables A, B, C and D are applicable to this contingency
5L96	Same as Table 1.14 – 5L81 O.O.S.
5L98	Same as Table 1.14 – 5L81 O.O.S.
5L96 & 5L98	Same as Table 1.14 – 5L81 O.O.S.
5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.16 – 5L83 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2
- 5L87 contingency:
  Limit (5L81 + 5L82 + 5L87) NIC < 4300 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
5L83 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Shed at MCA/REV: GS + 3.31 * M Where GS and M are calculated as follows: 　GS = Max (0, 3.31 * (5L82 NIC + 0.46 * 5L81 NIC - 5L82_Over_Rating)) 　Y = 2L112 NLY + 0.05 * 5L81 NIC - 0.15 * GS 　Z = -2L293 NLY + 0.05 * 5L81 NIC - 0.14 * GS 　If Y > NLYPST_OL_PickupMW, M1 = 0.38 * (Y – NLYPST_OL_ResetMW), Else M1 = 0 　If Z > 2L293OLRAS_PickupMW, M2 = 0.46 * (Z – 2L293OLRAS_Reset MW), Else M2 = 0 　M = Max (M1, M2)
5L82	Shed at MCA/REV: GS + 3.34 * M Where GS and M are calculated as follows: 　GS = Max (0, 3.34 * (5L81 NIC + 0.43 * 5L82 NIC - 5L81_Over_Rating)) 　Y = 2L112 NLY + 0.05 * 5L82 NIC - 0.14 * GS 　Z = -2L293 NLY + 0.04 * 5L82 NIC - 0.14 * GS 　If Y > NLYPST_OL_PickupMW, M1 = 0.38 * (Y – NLYPST_OL_ResetMW), Else M1 = 0 　If Z> 2L293OLRAS_PickupMW, M2 = 0.46 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0 　M = Max (M1, M2)
5L87	Shed at REV/MCA: 1.1 * [(5L81 + 5L82 + 5L87) NIC – 4400] MW
5L44	Same as 5L82 O.O.S. - Table 1.15.

5L81 and 5L82	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.
	
	　If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then GS is the greater of:
	　• 1.13 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA + 2L112 NLY – 2250], or
	　• 1.15 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY + 2L112 NLY – 3800]
	
	　If 2L112 NLY >= 200 AND 0.10 * (5L81 + 5L82) NIC + 2L293 SEL <= 420, then GS is the greater of:
	　• 1.18 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA – 2250], or
	　• 1.20 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY – 3800]
	
	　If AB to BC >= 500 MW AND GS >= 1500 MW, then
	　　• Arm DTT 5L94, and
	　　• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	　　• If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then
	　　　➢ Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.05 * AB to BC
	　　Otherwise,
	　　　➢ Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.10 * AB to BC
	　　• Total armed generation shedding must be limited to 2500 - AB to BC
	
	　If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500], then
	　　• Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: GS
	　　• Total armed generation shedding must be limited to 2500
	
	　Arm DTT 2L112 RAS, If
	　　• 2L112 NLY < 200 AND GS > 0 , or
	　　• 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420

Table 1.17 - 5L87 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:

- Notes 2 and 3 in Section 2

Generation Shedding Requirements
5L87 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S.: (5L75 contingency will trip open 5L76) • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	ACK 5CB8 in service: • If REV Gen <= 2000 MW, shed at REV: 1.03 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4270) MW ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75) • Shed at REV: 1.03 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – Y) MW Y = 3800 if REV Gen <= 2000 MW, or Y = 4100 if REV Gen > 2000 MW AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service.
5L81	GS1 = Max (0, 2.25 * (5L44 MDN + 0.68 * 5L81 NIC - 5L44_Over_Rating)) GS2 = Max (0, 3.32 * (5L82 NIC + 0.43 * 5L81 NIC - 5L82_Over_Rating)) If GS1 >= GS2, Y = 2L112 NLY + 0.06 * 5L81 NIC - 0.16 * GS1 Z = -2L293 NLY + 0.06 * 5L81 NIC - 0.15 * GS1 If Y > NLYPST_OL_PickupMW, M1 = 0.53 * (Y - NLYPST_OL_ResetMW), Else M1 = 0 If Z > 2L293OLRAS_PickupMW, M2 = 0.65 * (Z - 2L293OLRAS_ResetMW), Else M2 = 0 M = Max (M1, M2) Gen shed at MCA/REV: GS1 + 2.57 * M If GS2 > GS1, Y = 2L112 NLY + 0.06 * 5L81 NIC - 0.16 * GS2 Z = -2L293 NLY + 0.06 * 5L81 NIC - 0.15 * GS2 If Y > NLYPST_OL_PickupMW, R1 = 0.37 * (Y - NLYPST_OL_ResetMW), Else R1 = 0 If Z > 2L293OLRAS_PickupMW, R2 = 0.45 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0 R = Max (R1, R2) Gen shed at MCA/REV: GS2 + 3.69 * R
5L82	Shed at MCA/REV: GS + 3.58 * M Where GS and M are calculated as follows: GS = Max (0, 3.47 * (5L81 NIC + 0.39 * 5L82 NIC - 5L81_Over_Rating)) Y = 2L112 NLY + 0.05 * 5L82 NIC - 0.16 * GS Z = -2L293 NLY + 0.05 * 5L82 NIC - 0.15 * GS If Y > NLYPST_OL_PickupMW, M1 = 0.37 * (Y – NLYPST_OL_ResetMW), Else M1 = 0 If Z > 2L293OLRAS_PickupMW, M2 = 0.45 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0 M = Max (M1, M2)
5L83	Shed at MCA/REV: GS + 3.64 * M Where GS and M are calculated as follows: GS = Max (0, 3.35 * (5L82 NIC + 0.50 * 5L83 NIC - 5L82_Over_Rating)) Y = 2L112 NLY + 0.05 * 5L83 NIC - 0.16 * GS Z = -2L293 NLY + 0.04 * 5L83 NIC - 0.15 * GS If Y > NLYPST_OL_PickupMW, M1 = 0.38 * (Y – NLYPST_OL_ResetMW), Else M1 = 0 If Z > 2L293OLRAS_PickupMW, M2 = 0.47 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0 M = Max (M1, M2)
Bypass AMC 5CX1	No shedding required
Bypass AMC 5CX2	No shedding required
Bypass RYC 5CX1	No shedding required

5L81 and 5L82	GS1 = 1.69 * [5L83 NIC + 0.82 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	GS2 = 2.36 * [5L44 MDN + 0.25*(5L81 + 5L82) NIC - 5L44_Over_Rating]
	GS3 = 6.88 * [2L112 NLY + 0.07 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	GS4 = 7.23 * [2L293 SEL + 0.06 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL: 1.63 *[0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV].
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500], then
	• Shed at MCA/REV: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL: 1.63 * (GS – the armed gen-shedding amount at MCA/REV).
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 1.9 * [5L82 NIC + 0.80 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G2 = 5.9 * [2L112 NLY + 0.09 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G3 = 6.3 * [2L293 SEL + 0.08 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL: 1.34 *[0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500], then
	• Shed at MCA/REV: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL: 1.34 * (GS– the armed gen-shedding amount at MCA/REV)
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 1.9 * [5L81 NIC + 0.78 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G2 = 5.9 * [2L112 NLY + 0.10 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G3 = 6.3 * [2L293 SEL + 0.09 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL: 1.36 *[0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500], then
	• Shed at MCA/REV: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL: 1.36 * (GS – the armed gen-shedding amount at MCA/REV)
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency

5L44	GS1 = 3 * (5L81NIC + 0.36 * 5L44MDN – 5L81_Over_Rating)
	GS2 = 13.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 32* (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	   M = MAX (GS1, GS2, GS3, 0)
	   Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.11* M
	   Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.1 * M
	
	If Y > NLYPST_OL_PickupMW,
	   R1 = 0.44 * (Y - NLYPST_OL_ResetMW)
	   R3 = 0.08 * (Y - NLYPST_OL_ResetMW)
	   R5 = 0.04 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	   R2 = 0.52 * (Z - 2L293OLRAS_ResetMW)
	   R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	   R6 = 0.04 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	   ➢ D1 * (GS1 + 3* Ra)
	   ➢ D2 * (GS2 + 13.5* Rb)
	   ➢ D3 * (GS3 + 32* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 3.6 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.1 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.8 if shedding at GMS/PCN,
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L91	Tables A, B, C and D are applicable to this contingency

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z – Y), or
	   ➢ 2.40 * (2L112 NLY + 0.23 * (5L96 SEL + Z) – 400), or
	   ➢ 2.40 * (2L112 NLY + BDY Gen + 0.23 * (5L96 SEL + Z) – 1160), or
	   ➢ 3.04 * (2L293 SEL + 0.17 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	Y = 1880 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1800 if none of ACK 5CX1 & 5CX2 is in service AND all SEL T1 & T2 & T4 are in service
	Z = 48L KET if DTT 48L is armed, or
	Z = 0 if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➢ 1.60 * (5L91 SEL + 5L98 VAS − Y), or
	   ➢ 2.92 * (2L112 NLY + 0.14 * 5L98 VAS – 400), or
	   ➢ 4.07 * (2L293 SEL + 0.11 * 5L98 VAS – 400), and do not shed WAN for this requirement.
	Y = 1760 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1570 if none of ACK 5CX1 & 5CX2 is in service
	
	Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➢ 1.56 * (5L91 SEL + 5L98 VAS − Y), or
	   ➢ 2.79 * (2L112 NLY + 0.16 * 5L98 VAS – 400), or
	   ➢ 3.92 * (2L293 SEL + 0.12 * 5L98 VAS – 400), and do not shed WAN for this requirement.
	Y = 1740 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1530 if none of ACK 5CX1 & 5CX2 is in service

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z – Y), or
	   ➢ 2.49 * (2L112 NLY + 0.26 * (5L96 SEL + Z) – 400), or
	   ➢ 2.49 * (2L112 NLY + BDY Gen + 0.26 * (5L96 SEL + Z) – 1210), or
	   ➢ 2.94 * (2L293 SEL + 0.20 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	Y = 1850 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1790 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L is armed, or
	Z = 0 if DTT 48L is not armed

5L92	Same as Table A
5L94	Same as Table A
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required

Table 1.19 - 5L91 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit:
  5L96 SEL < 1300 MW from 1 December to April 30, or
  5L96 SEL < 1400 MW from 1 May to 30 November
- 5L76 and 5L79 contingency:
  - No 500kV Reactors at ACK in service.
  - Limit total flow on 5L76 and 5L79 from NIC to ACK < 100 MW
- 5L96, or 5L98, or 5L96 & 5L98 contingency:
  - If SEL 5RX3 is available, then limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW - Z
    Otherwise, limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW – 1 KCL @ MIN.MW - Z

    Where: FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW
    FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
- Alarm if 5L96 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
  if 5L96 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
  If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L96.

  Where:
  Y = AB to BC MW if AB to BC > 0, or
  Y = 0 if AB to BC <= 0 MW
  Z = 48L KET if VAS-WTS loop closed, or
  Z = 0 if VAS-WTS loop open.

Generation Shedding Requirements
5L91 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	ACK 5CB8 in service: No gen shedding. ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75) • Same as 5L75 (3P) contingency with ACK 5CB5 O.O.S. in this table.
5L79	No gen shedding. If TSA-PM alarms "VIOLATION_5L76_NORM_RATING", the BC Hydro Control Centre staff shall reduce REV generation to bring the flow on 5L76 ACK below the rating within 30 minutes.
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required
Bypass AMC 5CX2	No shedding required
Bypass RYC 5CX1	No shedding required
5L81 and 5L82	G1 = 2.9 * [5L44 MDN+ 0.15 * (5L81 + 5L82) NIC - 5L44_Over_Rating] G2 = 3.15 * [5L83 NIC+ 0.48 * (5L81 + 5L82) NIC - 5L83_Over_rating] G3 = 2.95 * [5L87 NIC+ 0.43 * (5L81 + 5L82) NIC - 5L87_Over_Rating] G4 = 8.46 * [2L112 NLY+ 0.07 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW] G5 = 9.13 * [2L293 SEL+ 0.05 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW] GS = Max (0, G1, G2, G3, G4, G5) • Shed at MCA/REV first: GS • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.82 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G3 > 0. • Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, • keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 KCL (with high side 2CBs in service) on line post-shedding if SEL 5RX3 is available, or • keep a minimum of 2 MCA, 1 REV, 2 SEV, 1 KCL (with high side 2CBs in service) and 1 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable, or • keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or • keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition. If TSA alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions: If BC is exporting to US, then reduce BC to US export. If BC is importing from US, then • reduce (SI and FBC) generation and increase Peace generation, or/and • reduce (SI and FBC) generation and increase import from US.
5L81 and 5L83	G1 = 3.04 * [5L44 MDN + 0.12 * (5L81 + 5L83) NIC - 5L44_Over_rating] G2 = 3.5 * [5L82 NIC + 0.44 * (5L81 + 5L83) NIC - 5L82_Over_Rating]

CONTINGENCY	SHEDDING REQUIREMENTS
	G3 = 2.91 * [5L87 NIC + 0.44 * (5L81 + 5L83) NIC - 5L87_Over_Rating] G4 = 8.48 * [2L112 NLY + 0.06 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW] G5 = 9.16 * [2L293 SEL + 0.05 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW] GS = Max (0, G1, G2, G3, G4, G5) • Shed at MCA/REV first: GS • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.85 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding. • Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, • keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 KCL (with high side 2CBs in service) on line post-shedding if SEL 5RX3 is available, or • keep a minimum of 2 MCA, 1 REV, 2 SEV, 1 KCL (with high side 2CBs in service) and 1 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable, or • keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or • keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition. If TSA alarms "C5L81_83 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions: If BC is exporting to US, then reduce BC to US export. If BC is importing from US, then • reduce (SI and FBC) generation and increase Peace generation, or/and • reduce (SI and FBC) generation and increase import from US.
5L82 and 5L83	If generation shedding is armed, • keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 KCL (with high side 2CBs in service) on line post-shedding if SEL 5RX3 is available, • or keep a minimum of 2 MCA, 1 REV, 2 SEV, 1 KCL (with high side 2CBs in service) and 1 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable, or • keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or • keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition. If TSA alarms "C5L82_83 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions: If BC is exporting to US, then reduce BC to US export. If BC is importing from US, then • reduce (SI and FBC) generation and increase Peace generation, or/and • reduce (SI and FBC) generation and increase import from US. G1 = 6.7 * [5L42 KLY + 0.27 * (5L82 + 5L83) NIC - 5L42_Over_Rating] G2 = 3.2 * [5L81 NIC + 0.44 * (5L82 + 5L83) NIC - 5L81_Over_Rating] G3 = 2.9 * [5L87 NIC + 0.47 * (5L82 + 5L83) NIC - 5L87_Over_Rating] G4 = 8.7 * [2L112 NLY + 0.05 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW] G5 = 9.3 * [2L293 SEL + 0.04 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW] GS = Max (0, G1, G2, G3, G4, G5) • Shed at MCA/REV first: GS • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.86 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding. • Total armed generation shedding must be limited to 2500 MW.

5L76 and 5L79	With VAS-VNT loop closed, then
	If (5L76 ACK + 5L79 ACK) > 30 MW, then shed REV down to: A - 35MW
	Keep at least one unit online after shedding.
	Issue an alarm when under/over shed more than 35MW.
	A = the 500 kV to 230 kV transfer at ACK – 1L214 VNT - 1L209 SAM – 73L LEE – 100
	With VAS-VNT loop open, then
	If (5L76 ACK + 5L79 ACK) > 20 MW, then shed REV down to: A - 25MW
	Keep at least one unit online after shedding.
	Issue an alarm when under/over shed more than 25MW.
	A = the 500 kV to 230 kV transfer at ACK – 1L214 VNT - 1L209 SAM – 100
	Note. The MW on 1L209 could be approximated by (1.732 * voltage at SAM * the current of 1L209 from SAM).
	
	If generation shedding is armed,
	• Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
	• Arm DTT ACK 5CX2 if ACK 5CX2 is in service.

5L87	No shedding required.

CONTINGENCY	SHEDDING REQUIREMENTS

5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81_Over_Rating)
	GS2 = 12.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 31.0 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.04 * 5L44 MDN – 0.11* M
	Z = 2L293 SEL + 0.04 * 5L44 MDN – 0.1 * M
	
	If Y > NLYPST_OL_PickupMW,
	    R1 = 0.35 * (Y - NLYPST_OL_ResetMW)
	    R3 = 0.08 * (Y - NLYPST_OL_ResetMW)
	    R5 = 0.04 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	    R2 = 0.42 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	    R6 = 0.04 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➢ D1 * (GS1 + 3.5* Ra)
	  ➢ D2 * (GS2 + 12.5* Rb)
	  ➢ D3 * (GS3 + 31.0* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.5 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.05 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation.

5L96 (TSA-PM must treat it as "5L91 AND 5L96" contingency because "5L96" signal won't be generated as long as 5L91 O.O.S.)	Tables A, B, C and D for contingency 5L91 AND 5L96 are applicable to this contingency.

5L98	• Arm DTT 2L112 RAS
	• Arm DTT 73L RAS if VAS-VNT loop is closed.
	• Shed at KCL/ALH/SEV/WAN/BRX/WAX: 5L98 VAS + 2L112 NLY + Y + Z + W – 850 MW
	  Y = 0 if AB to BC >= 0 MW, or Y = (BC to AB transfer) if BC to AB > 0 MW
	  Z = 73L RGA if DTT 73L RAS is armed, or Z = 0 if DTT 73L RAS is not armed.
	  W = 0 if MATL120S_PST230 <= 0 MW, or W = MATL120S_PST230 if MATL120S_PST230 > 0 MW
	• If generation shedding is armed, keep a minimum of 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or keep a minimum of 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable, or keep a minimum of 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.

5L96 & 5L98	• Arm DTT 2L112 RAS
	• Arm DTT 48L RAS if both VAS-WTS and VAS-VNT loops are closed
	• Shed at KCL/ALH/SEV/WAN/BRX/WAX: 5L96 SEL + 2L112 NLY + Y + Z + W – 850 MW
	  Y = 0 if AB to BC >= 0 MW, or Y = (BC to AB transfer) if BC to AB > 0 MW
	  Z = 48L KET if DTT 48L RAS is armed, or Z = 0 if DTT 48L RAS is not armed.
	  W = 0 if MATL120S_PST230 <= 0 MW, or W = MATL120S_PST230 if MATL120S_PST230 > 0 MW
	• If generation shedding is armed, keep a minimum of 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or keep a minimum of 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable, or keep a minimum of 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition..
	
	Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.

5L92	(Note: Arming requirements for DTT 5L94, DTT 1L274 and DTT 1L275 are included in SOO 7T-17)
	  Arm DTT 2L112 RAS if
	  ➢ (0 < AB to BC <= 100 MW) AND (2L293 NLY > 400 – 0.7 * 5L92 CBK MW), or
	  ➢ (AB to BC > 100 MW) AND (2L293 NLY > 400 – 5L92 CBK + 0.68 * (AB to BC) MW), or
	  ➢ (0 <= BC to AB <= 100 MW) AND (2L293 SEL > 400 – 0.87 * 5L92 SEL + 0.2 * (BC to AB) MW), or
	  ➢ (BC to AB > 100 MW) AND (2L293 SEL > 400 – 5L92 SEL + 0.7 * (BC to AB) MW)

CONTINGENCY	SHEDDING REQUIREMENTS

5L94	(Note: Arming requirements for DTT 1L274 and DTT 1L275 are included in SOO 7T-17.)
	• Arm DTT 2L112 RAS if
	  ➢ 2L112 BDY + 0.3 * (AB to BC) > 400 MW, or
	  ➢ 2L293 NLY + 0.2 * (AB to BC) > 400 MW, or
	  ➢ 2L112 NLY + 0.3 * (BC to AB) > 400 MW, or
	  ➢ 2L293 SEL + 0.2 * (BC to AB) > 400 MW
	And
	• Shed at KCL/SEV/ALH/WAN/BRX/REV/WAX the greatest of:
	  ➢ 5L96 SEL+2L112 NLY + (BC to AB) – 1250 MW if DTT 2L112 RAS for 5L92 or 5L94 contingency is armed, or
	  ➢ 5L96 SEL + (BC to AB) – 1550 MW if DTT 2L112 RAS for 5L92 or 5L94 contingency is not armed, or
	  ➢ (BC to AB) MW If (BC to US + BC to AB) > 2400 MW, or
	  ➢ (BC to AB) – 400 MW If 700 MW < (BC to US + BC to AB) <= 2400 MW
	• If generation shedding is armed, keep a minimum of 2 REV, 2 SEV, 1 KCL and 1/3 equivalent SEV units on-line post-shedding, or keep a minimum of 2 REV, 2 SEV, and 1 equivalent SEV units on-line post-shedding if the whole KCL is shutdown in pre-contingency condition.

Bypass GUI	No shedding required.
5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.20 - 5L96 O.O.S. (Any Status of VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Transfer limit on 5L91 SEL:
  If higher transfer on 5L91 SEL is required than the limit shown in the table below for the VAS-WTS loop closed, the Operator should work with FBC to open the VAS-WTS loop (FBC chose the location to open).

Y = FBC's Load calculated by (2L263 VNT + 2L264 VNT + 34L WTS – 5L98 VAS) MW

Status of VAS-WTS Loop	ACK 5CX1 / 5CX2 In-Service Unit Number	Transfer Limit on 5L91 SEL (MW)	
		Y <= 380 MW	Y > 380 MW
Both Loops Closed (Status A)	>= 1	1450 (to avoid ASM T1/T2 OL)	1300 (to avoid ASM T1/T2 OL)
	0	1450 (to avoid ASM T1/T2 OL)	1300 (to avoid ASM T1/T2 OL)
VAS-WTS Open and VAS-VNT Closed (Status B)	>= 1	1800 (to avoid SEL500 < 1.0 pu)	1530 (to avoid SEL500 < 1.0 pu)
	0	1700 (to avoid SEL500 < 1.0 pu)	1360 (to avoid SEL500 < 1.0 pu)
VAS-WTS Closed and VAS-VNT Open (Status C)	>= 1	1450 (to avoid ASM T1/T2 OL)	1300 (to avoid ASM T1/T2 OL See Note (a) below)
	0	1450 (to avoid ASM T1/T2 OL)	1300 (to avoid ASM T1/T2 OL See Note (b) below)
Both Loops Open (Status D)	>= 1	1800 (to avoid SEL500 < 1.0 pu)	1460 (to avoid SEL500 < 1.00 pu), (See Note (a) below)
	0	1700 (to avoid SEL500 < 1.0 pu)	1360 (to avoid SEL500 < 1.00 pu), (See Note (b) below)

Note (a): With VAS-VNT loop open, this limit is based on the condition that the FBC's load supplied from VNT is reduced down to 300 MW to maintain voltages in this area above 220 kV.

Note (b): With VAS-VNT loop open, this limit is based on the condition that the FBC's load supplied from VNT is reduced down to 270 MW to maintain voltages in this area above 220 kV.

If alarm comes, the Operator should reduce the flow on 5L91 by:
- Reducing Alberta to BC transfer, and/or
- Reducing FBC's power injection into SEL, and/or
- Reducing SEV / KCL generation, and/or
- Adjusting NLY PST to increase 2L112 (NLY to BDY) transfer.

- 5L76 and 5L79 contingency:
  Note: Y = 1L209 SAM if 1L209 is not radial, or Y = 0 if 1L209 is radial.
      U = 48L KET if VAS-WTS loop is closed, or U = 0 if VAS-WTS loop is open
      W = 73L RGA if VAS-VNT loop is closed, or W = 0 if VAS-VNT loop is open
  - Limit: 5L76 ACK +5L79 ACK + 2L112 NLY + Y + 1L214 VNT + U - W < 2500 MW
  - Alarm if 5L76 ACK +5L79 ACK + 2L112 NLY + Y + 1L214 VNT + U - W < -700 MW AND MATL120S_PST230 >= 0 MW, or
    if 5L76 ACK +5L79 ACK + 2L112 NLY + Y + 1L214 VNT + U - W + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    If the alarm comes, the BC Hydro Control Centre staff must put more REV or/and SIE generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L76 and 5L79 with 1L209, 1L214 and 2L112 transfer tripped.
  - At least two of ACK 5RX4 and 5RX7 and 5RX8 must be available.

- 5L91 contingency:
  - If SEL 5RX3 is available, then limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW
  Otherwise, limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW – 1 KCL @ MIN.MW
  Where: FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW
        FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
        Y = AB to BC MW if AB to BC > 0, or
        Y = 0 if AB to BC <= 0
  - Alarm if 5L91 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
      if 5L91 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    Z = 48L KET if VAS-WTS loop is closed, or Z = 0 if VAS-WTS loop is open
    If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91.

Generation Shedding Requirements
(5L96 O.O.S. (Any status of VAS-WTS and VAS-VNT Loops))
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F

5L76	ACK 5CB8 in service:
	Shed at REV: 1.03 * ((5L75 + 5L77) REV + 5L91SEL – 3260) MW
	
	ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75)
	• Shed at REV: 1.03 * ((5L75 + 5L77) REV + 5L91 SEL – Y) MW
	  Y = 2770 if REV Gen <= 2000 MW, or
	  Y = 2690 if REV Gen > 2000 MW
	AND
	• If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.

5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service.
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required
Bypass AMC 5CX2	No shedding required
Bypass RYC 5CX1	No shedding required

5L81 and 5L82	G1 = 3.34 * [5L44 MDN+ 0.14 * (5L81 + 5L82) NIC - 5L44_Over_Rating]
	G2 = 3.57 * [5L83 NIC + 0.47 * (5L81+5L82) NIC - 5L83_Over_rating]
	G3 = 3.23 * [5L87 NIC+ 0.43 * (5L81 +5L82) NIC - 5L87_Over_Rating]
	G4 = 7.68 * [2L112 NLY+ 0.07 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G5 = 6.94 * [2L293 SEL+ 0.06 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.61 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed,
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 KCL (with high side 2CBs in service) on line post-shedding if SEL 5RX3 is available, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV, 1 KCL (with high side 2CBs in service) and 1 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	If TSA alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	  If BC is exporting to US, then reduce BC to US export.
	  If BC is importing from US, then
	• reduce (SI and FBC) generation and increase Peace generation, or/and
	• reduce (SI and FBC) generation and increase import from US.

5L81 and 5L83	G1 = 3.53* [5L44 MDN + 0.1* (5L81 + 5L83) NIC - 5L44_Over_Rating]
	G2 = 4.02 * [5L82 NIC + 0.45 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G3 = 3.18 * [5L87 NIC + 0.43 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 7.66 * [2L112 NLY + 0.07 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 6.96 * [2L293 SEL + 0.06 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.59 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed,
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 KCL (with high side 2CBs in service) on line post-shedding if SEL 5RX3 is available, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV, 1 KCL (with high side 2CBs in service) and 1 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	If TSA alarms "C5L81_83 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	  If BC is exporting to US, then reduce BC to US export.
	  If BC is importing from US, then
	• reduce (SI and FBC) generation and increase Peace generation, or/and
	• reduce (SI and FBC) generation and increase import from US.

CONTINGENCY	SHEDDING REQUIREMENTS

5L82 and 5L83	G1 = 6.9 * [5L42 KLY + 0.27 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G2 = 3.6 * [5L81 NIC + 0.44 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 3.1 * [5L87 NIC + 0.47 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 8.7 * [2L112 NLY + 0.05 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 9.3 * [2L293 SEL + 0.05 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 2.04 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed,
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 KCL (with high side 2CBs in service) on line post-shedding if SEL 5RX3 is available, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV, 1 KCL (with high side 2CBs in service) and 1 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable,
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	If TSA alarms "C5L82_83 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	    If BC is exporting to US, then reduce BC to US export.
	    If BC is importing from US, then
	    • reduce (SI and FBC) generation and increase Peace generation, or/and
	    • reduce (SI and FBC) generation and increase import from US.

5L76 and 5L79	• Arm DTT 1L209 except for 1L209 radial connection, and
	• Arm DTT 1L214, and
	• Arm DTT 2L112, and
	• Arm DTT 48L RAS if VAS-WTS loop is closed, and
	• Arm DTT 73L RAS if VAS-VNT loop is closed, and
	• Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
	  5L76 ACK + 5L79 ACK + 2L112 NLY + Z + 1L214 VNT + Y + U + V - W – 850 MW
	  Y = 0 if AB to BC >= 0 MW, or Y = (BC to AB transfer) if BC to AB > 0 MW
	  Z = 1L209 SAM if 1L209 is not radial, or Z = 0 if 1L209 is radial.
	  U = 48L KET if DTT 48L RAS is armed, or U = 0 if DTT 48L RAS is not armed.
	  V = 0 MW if MATL120S_PST230 <= 0 MW, or V = MATL120S_PST230 if MATL120S_PST230 > 0 MW
	  W = 73L RGA if DTT 73L RAS is armed, or W = 0 if DTT 73L RAS is not armed.
	• If generation shedding is armed, then
	    • Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
	    • Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and
	    • Keep a minimum of 1 REV and 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or
	    Keep a minimum of 1 REV, 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable, or
	    Keep a minimum of 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.

5L87	No shedding required.
5L44	Same as Table 1.19 – 5L91 O.O.S.

5L91
(TSA-PM must treat it as "5L91 AND 5L96" contingency because "5L91" signal won't be generated as long as 5L96 O.O.S.)
	• Arm DTT 2L112 RAS
	• Arm DTT 48L RAS if VAS-WTS loop is closed
	• Shed at KCL/ALH/SEV/WAN/BRX/WAX: 5L91 SEL + 2L112 NLY + Y + Z + W – 850 MW
	  Y = 0 if AB to BC >= 0 MW, or Y = (BC to AB transfer) if BC to AB > 0 MW
	  Z = 48L KET if DTT 48L RAS is armed, or Z = 0 if DTT 48L RAS is not armed.
	  W = 0 MW if MATL120S_PST230 <= 0 MW, or W = MATL120S_PST230 if MATL120S_PST230 > 0 MW
	If generation shedding is armed, keep a minimum 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or keep a minimum of 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable, or keep a minimum of 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.

5L98
(TSA-PM must treat it as "5L96 AND 5L98" contingency because "5L98" signal won't be generated as long as 5L96 O.O.S.)
	Note to FBC: When both VAS-WTS and VAS-VNT loops are open, 5L98 contingency with 5L96 already out of service will black out the FBC's loads which are radially connected to VAS. When VAS-VNT loop is open and VAS-WTS loop is closed, 5L98 contingency may cause overloading on ASM T1/T2, or voltage instability in the area which is radially supplied from WTS.
	
	• Arm DTT 48L RAS if both VAS-WTS and VAS-VNT loops are closed and 5L91 SEL > 700 MW.
	• Shed at KCL/ALH/BRX/WAN/WAX first, then SEV the greatest of:
	  • 1.25 * (5L91 SEL + Z - Y), or
	  • 2.37 * (2L112 NLY + 0.24 * Z – 400), or
	  • 3.05 * (2L293 SEL + 0.17 * Z – 400), and do not shed WAN for this requirement
	  Y = 1600 if at least 1 ACK 5CX1 and 5CX2 is in service, or
	  Y = 1300 if none of ACK 5CX1 and 5CX2 is in service
	  Z = 48L KET if DTT 48L RAS is armed, or
	  Z = 0 if DTT 48L RAS is not armed.

5L92	Same as Table 1.19 5L91 O.O.S.

CONTINGENCY	SHEDDING REQUIREMENTS
5L94	(Note: Arming requirements for DTT 1L274 and DTT 1L275 are included in SOO 7T-17) • Arm DTT 2L112 RAS if ➢ 2L112 BDY + 0.3 * (AB to BC) > 400 MW, or ➢ 2L293 NLY + 0.2 * (AB to BC) > 400 MW, or ➢ 2L112 NLY + 0.3 * (BC to AB) > 400 MW, or ➢ 2L293 SEL + 0.2 * (BC to AB) > 400 MW And • Shed at KCL/SEV/ALH/WAN/BRX/REV/WAX the greatest of: ➢ 5L91 SEL+2L112 NLY + (BC to AB) – 1450 MW if DTT 2L112 RAS for 5L92 or 5L94 contingency is armed, or ➢ 5L91 SEL + (BC to AB) – 1750 MW if DTT 2L112 RAS for 5L92 or 5L94 contingency is not armed, or ➢ (BC to AB) MW **If** (BC to US + BC to AB) > 2400 MW, or ➢ (BC to AB) – 400 MW **If** 700 MW < (BC to US + BC to AB) <= 2400 MW • If generation shedding is armed, keep a minimum of 2 REV, 2 SEV, 1 KCL and 1/3 equivalent SEV units on-line post-shedding, or keep a minimum of 2 REV, 2 SEV, and 1 equivalent SEV units on-line post-shedding if the whole KCL plant is shutdown.
Bypass GUI	No shedding required.
5L91 (1P) or 5L98 (1P)	Shed at KCL/SEV/ALH/BRX/WAN/WAX: 1.35 * (5L91 SEL – 1500) MW

Table 1.21 – 5L98 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Transfer limit on (5L91 + 5L96) SEL:
  The limit is to avoid VAS500 < 1.00 pu with VAS-VNT loop closed, or avoid SEL500 < 1.00 pu with VAS-VNT loop open.

  Y = FBC's Load calculated by (2L263 VNT + 2L264 VNT + 34L WTS +5L96 SEL) MW

ACK 5CX1 / 5CX2 In-Service Unit Number	Transfer Limit on (5L91 + 5L96) SEL (MW)	
	Y <= 380 MW	Y > 380 MW
>= 1	1900	1640 See Note (a) below
0	1850	1500 See Note (b) below

  Note (a): When VAS-VNT loop is open, this limit is based on the condition that 73L DGB-RGA circuit is open and the FBC's load supplied from VNT is reduced down to 290 MW to maintain voltages in this area above 220 kV.
  Note (b): When VAS-VNT loop is open, this limit is based on the condition that 73L DGB-RGA circuit is open and the FBC's load supplied from VNT is reduced down to 270 MW to maintain voltages in this area above 220 kV.

  If alarm comes, the Operator should reduce the flow on 5L91 by:
  - Reducing Alberta to BC transfer, and/or
  - Reducing FBC's power injection into SEL, and/or
  - Reducing SEV / KCL generation, and/or
  - Adjusting NLY PST to increase 2L112 (NLY to BDY) transfer.

- 5L76 and 5L79 contingency:
  Note: Y = 1L209 SAM if 1L209 is not radial, or Y = 0 if 1L209 is radial

  - Limit: 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y < 2500 MW
  - Alarm if 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y < -700 MW AND MATL120S_PST230 >= 0 MW, or
    if 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    If the alarm comes, the BC Hydro Control Centre staff must put more REV or/and SIE generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L76 and 5L79 with 1L209, 1L214 and 2L112 transfer tripped.
  - At least two of ACK 5RX4 and 5RX7 and 5RX8 must be available.
- 5L91, or 5L91 AND 5L96 contingency:
  - If SEL 5RX3 is available, then limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW - Z
  Otherwise, limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW – 1 KCL @MIN.MW - Z
    Where FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW
        FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
        Y = AB to BC MW if AB to BC > 0, or
        Y = 0 if AB to BC <= 0
        If both VAS-WTS and VAS-VNT loops are closed, then Z = 48L KET, otherwise, Z = 0
  - Alarm if 5L91 SEL + 5L96 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
    if 5L91 SEL + 5L96 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    If both VAS-WTS and VAS-VNT loops are closed, then Z = 48L KET, otherwise, Z = 0.
    If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91, or 5L91 and 5L96.

Generation Shedding Requirements
(5L98 O.O.S (Any Status of FBC's VAS-WTS and VAS-VNT Loops))
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	<u>ACK 5CB5 in service:</u> Same as Table F <u>ACK 5CB5 O.O.S.</u> (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) AND 5L77 (3P)	Same as Table F
5L75 (3P) AND 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F

5L76	<u>ACK 5CB8 in service:</u>
	  Shed at REV: 1.02 * ((5L75 + 5L77) REV + 5L91 SEL – 3150) MW
	
	<u>ACK 5CB8 O.O.S.:</u> (5L76 contingency will trip open 5L75)
	• Shed at REV: 1.02 * ((5L75 + 5L77) REV + 5L91 SEL – Y) MW
	  Y = 2800 if REV Gen <= 1500, or
	  Y = 2650 if REV Gen > 1500
	AND
	• If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.

5L79	Same as gen shedding as 5L76 contingency with ACK 5CB8 in service.
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.
5L81 and 5L82	Same as Table 1.20 – 5L96 O.O.S.
5L81 and 5L83	Same as Table 1.20 – 5L96 O.O.S.
5L82 and 5L83	Same as Table 1.20 – 5L96 O.O.S.

5L76 and 5L79	• Arm DTT 1L209 except for 1L209 radial connection, and
	• Arm DTT 1L214, and
	• Arm DTT 2L112 RAS, and
	• Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + *Y* + *Z* + *V* – 850 MW
	
	  Y = 0 if AB to BC >= 0 MW, or *Y* = (BC to AB transfer) if BC to AB > 0 MW
	  Z = 1L209 SAM if 1L209 is not radial, or *Z* = 0 if 1L209 is radial
	  V = 0 if MATL120S_PST230 <= 0 MW or V = MATL120S_PST230 if MATL120S_PST230 > 0 MW
	• If generation shedding is armed, then
	  • Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
	  • Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and
	  • keep a minimum of 1 REV and 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or keep a minimum of 1 REV, 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is not available, or keep a minimum of 1 REV, 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is not available and the whole KCL plant is shutdown in pre-contingency condition.
	
	Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.

5L87	Same as 5L96 O.O.S. Table 1.20

5L91 and 5L96	• Arm DTT 2L112 RAS
	• Arm DTT 48L RAS if both VAS-WTS and VAS-VNT loops are closed
	• Shed at KCL/ALH/SEV/WAN/BRX/WAX: 5L91 SEL + 5L96 SEL + 2L112 NLY + *Y* + *Z* + *W* – 850 MW
	  Y = 0 if AB to BC >= 0 MW, or *Y* = (BC to AB transfer) if BC to AB > 0 MW
	  Z = 48L KET if DTT 48L RAS is armed, or *Z* = 0 if DTT 48L RAS is not armed
	  W = 0 if MATL120S_PST230 <= 0 MW or W = MATL120S_PST230 if MATL120S_PST230 > 0 MW
	• If generation shedding is armed, keep a minimum of 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or
	• Keep a minimum of 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable, or
	• Keep a minimum of 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.

5L44	Same as Table 1.19 – 5L91 O.O.S.

5L91	• Arm DTT 2L112 RAS
	• Arm DTT 73L RAS if VAS-VNT loop is closed
	• Shed at KCL/ALH/SEV/WAN/BRX/WAX: 5L91 SEL + 2L112 NLY + *Y* + *Z* + *W* – 850 MW
	  Y = 0 if AB to BC >= 0 MW, or *Y* = (BC to AB transfer) if BC to AB > 0 MW
	  Z = 73L RGA if DTT 73L RAS is armed, or *Z* = 0 if DTT 73L RAS is not armed
	  W = 0 if MATL120S_PST230 <= 0 MW or W = MATL120S_PST230 if MATL120S_PST230 > 0 MW
	If generation shedding is armed, keep a minimum of 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or keep a minimum of 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable, or keep a minimum of 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.

5L96
(TSA-PM must treat it as "5L96 AND 5L98" contingency because "5L96" signal won't be generated as long as 5L98 O.O.S.)
	• Arm DTT 48L RAS if both VAS-WTS and VAS-VNT loops are closed and 5L91 SEL > 700 MW.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    • 1.25 * (5L91 SEL + 5L96 SEL + Z - Y), or
	    • 2.37 * (2L112 NLY + 0.24 * (5L96 SEL + Z) – 400, or
	    • 2.37 * (2L112 NLY + BDY Gen + 0.24 * (5L96 SEL + Z) – 1120), or
	    • 3.05 * (2L293 SEL + 0.17 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	Y = 1600 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1300 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L RAS is armed, or
	Z = 0 if DTT 48L RAS is not armed.
	
	Note: When both VAS-WTS and VAS-VNT loops are open, 5L96 contingency with 5L98 already out of service will black out the FBC's loads which are radially connected to VAS. When VAS-VNT loop is open and VAS-WTS loop is closed, 5L96 contingency may cause overloading on ASM T1/T2, or voltage instability in the area which is radially supplied from WTS.

5L92	Same as Table 1.19 – 5L91 O.O.S.
5L94	Same as Table 1.20 – 5L96 O.O.S.
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P)	Shed at KCL/SEV/ALH/BRX/WAN/WAX: 1.35 * (5L91 SEL – 1500) MW

Table 1.22 – 5L96 AND 5L98 O.O.S. (Any Status of VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Transfer limit on 5L91 SEL:
  If higher transfer on 5L91 SEL is required than the limit shown in the table below for the VNT-VAS-WTS loop closed, the VNT-VAS-WTS loop must be open (FBC chose the location to open to assure the voltages in their Okanagan area above 220 kV).

Y = FBC's Load calculated by (2L263 VNT + 2L264 VNT + 34L WTS) MW

Status of VNT-VAS-WTS Loop	ACK 5CX1 / 5CX2 In-Service Unit Number	Transfer Limit on 5L91 (MW)	
		Y <= 380 MW	Y > 380 MW
Closed	>= 1	1350 (to avoid ASM T1/T2 OL)	800 (to avoid BEN230 < 220 kV, see Note (a) below)
	0	1350 (to avoid ASM T1/T2 OL)	750 (to avoid BEN230 < 220 kV, see Note (a) below)
Open	>= 1	1850 (to avoid SEL500 < 1.0 pu)	1650 if 2 ACK CXs are in service, or 1550 if 1 ACKCX is in service (to avoid BEN230-RGA230-LEE230 < 220 kV, see Notes (a & b) below)
	0	1800 (to avoid SEL500 < 1.0 pu)	1350 (to avoid BEN230-RGA230-LEE230 < 220 kV, see Notes (a & b & c) below)

Note (a): This limit is based on the condition per FBC's OO 2P-21 that the FBC's South Okanagan load (RGA plus BEN load) is reduced down to 170 MW to maintain voltage stability in this area.
Note (b): This is based on the condition that 48L is open and 42L is meshed, or 40L open and 42L not meshed so that the charging of 75L and 76L would help to maintain RGA230 voltage above 220 kV.
Note (c): This limit is based on the FBC's Kelowna load down to 290 MW to maintain voltage stability in this area.

If alarm comes, the Operator should reduce the flow on 5L91 by:
- Reducing Alberta to BC transfer, and/or
- Reducing FBC's power injection into SEL, and/or
- Reducing SEV / KCL generation, and/or
- Adjusting NLY PST to increase 2L112 (NLY to BDY) transfer.

- 5L76 and 5L79 contingency:
  Note: Y = 1L209 SAM if 1L209 is not radial, or Y = 0 if 1L209 is radial

  - Limit: 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y < 2500 MW
  - Alarm if 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y < -700 MW AND MATL120S_PST230 >= 0 MW, or
    if 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    If the alarm comes, the BC Hydro Control Centre staff must put more REV or/and SIE generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L76 and 5L79 with 1L209, 1L214 and 2L112 transfer tripped.
  - At least two of ACK 5RX4 and 5RX7 and 5RX8 must be available.
- 5L91 contingency:
  - If SEL 5RX3 is available, then limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW - Z
    Otherwise, limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW – 1 KCL @MIN.MW - Z
    Where FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW
        FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
        Y = AB to BC MW if AB to BC > 0, or
        Y = 0 if AB to BC <= 0
        Z = 48L KET if WTS-VAS-VNT loop is closed, or
        Z = 0 if WTS-VAS-VNT loop is open
  - Alarm if 5L91 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
      if 5L91 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    Z = 48L KET if WTS-VAS-VNT loop is closed, or
    Z = 0 if WTS-VAS-VNT loop is open
    If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91.

Generation Shedding Requirements
(5L96 AND 5L98) O.O.S (Any Status of VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	Same as Table 1.20 – 5L96 O.O.S.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	Same as Table 1.20 - 5L96 O.O.S.
5L79	Same as Table 1.20 – 5L96 O.O.S.
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.
5L81 and 5L82	Same as Table 1.20 – 5L96 O.O.S.
5L81 and 5L83	Same as Table 1.20 – 5L96 O.O.S.
5L82 and 5L83	Same as Table 1.20 – 5L96 O.O.S.
5L76 and 5L79	- Arm DTT 1L209 except for 1L209 radial connection, and - Arm DTT 1L214, and - Arm DTT 2L112, and - Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: 5L76 ACK + 5L79 ACK + 2L112 NLY + Z + 1L214 VNT + Y + V – 850 MW $Y = 0$ if AB to BC >= 0 MW, or Y = (BC to AB transfer) if BC to AB > 0 MW Z = 1L209 SAM if 1L209 is not radial, or $Z = 0$ if 1L209 is radial. $V = 0$ if MATL120S_PST230 <= 0 MW, or V = MATL120S_PST230 if MATL120S_PST230 > 0 MW - If generation shedding is armed, then - Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and - Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and - keep a minimum of 1 REV and 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or keep a minimum of 1 REV, 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable, or keep a minimum of 1 REV, 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition. Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.
5L87	Same as Table 1.20 - 5L96 O.O.S.
5L91 (TSA-PM must treat it as "5L91 AND 5L96" contingency because "5L91" signal won't be generated as long as 5L96 O.O.S.)	- Arm DTT 2L112 RAS - Arm DTT 48L RAS if WTS-VAS-VNT loop is closed - Shed at KCL/ALH/SEV/WAN/BRX/WAX: 5L91 SEL + 2L112 NLY + Y + Z + W – 850 MW $Y = 0$ if AB to BC >= 0 MW, or Y = (BC to AB transfer) if BC to AB > 0 MW Z = 48L KET if DTT 48L RAS is armed, or $Z = 0$ if DTT 48L RAS is not armed $W = 0$ if MATL120S_PST230 <= 0 MW, or W = MATL120S_PST230 if MATL120S_PST230 > 0 MW If generation shedding is armed, keep a minimum 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or keep a minimum of 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable, or keep a minimum of 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition. Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.
5L44	Same as Table 1.19 – 5L91 O.O.S.
5L92	Same as Table 1.19 – 5L91 O.O.S.
5L94	Same as Table 1.20 – 5L96 O.O.S.
Bypass GUI 5CX1	No shedding required.
5L91(1P)	Shed at KCL/SEV/ALH/BRX/WAN/WAX: 1.35 * (5L91 SEL – 1500) MW

Table 1.23 - 5L92 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Note 2 in Section 2
- 5L87 contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 5600 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.
- 5L91 and 5L96 contingency:
  - Limit: 5L91 SEL + 5L96 SEL + Y + Z < 2500 MW
  - limit:
    FBC injection into SEL area < WAN shedable generation amount + ALH MW + BRX MW + WAX MW +
    – Min (1 SEV@MIN_MW, 1KCL @MIN_MW) – Z + W

    Y = 2L112 NLY if 2L112 NLY > 0, or
    Y = 0 if 2L112 NLY <= 0
    Z = 48L KET if VAS-WTS loop closed, or
    Z = 0 if VAS-WTS loop open
    W is the lesser of:
    - 2L294_Over_Rating, or
    - 2L294 NLY + CBK 500 kV to 230 kV MW + 1L274 POC – 1L275 NTL + 100
    FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW
    FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW

Generation Shedding Requirements
5L92 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): - Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this Table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F

5L76	ACK 5CB8 is in service:
	If REV Gen <= 2000 MW, then shed at REV: 1.03 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4050) MW
	
	ACK 5CB8 is O.O.S.: (5L76 contingency will trip open 5L75)
	Shed at REV: 1.03 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – Y) MW
	    Y = 3570 if REV Gen <= 2000 MW, or
	    Y = 3770 if REV Gen > 2000 MW
	  AND
	- If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.

5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service.
5L81	Same as system normal Table 1.1.
5L82	Same as system normal Table 1.1.
5L83	Same as system normal Table 1.1.
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.
5L81 and 5L82	G1 = 3.06 * [5L44 MDN + 0.14 * (5L81 + 5L82) NIC - 5L44_Over_Rating] G2 = 3.33 * [5L83 NIC + 0.47 * (5L81 + 5L82) NIC - 5L83_Over_rating] G3 = 3.09 * [5L87 NIC + 0.42 * (5L81 + 5L82) NIC - 5L87_Over_Rating] G4 = 6.08 * [2L112 NLY + 0.08 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW] G5 = 4.24 * [2L293 SEL + 0.07 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW] GS = Max (0, G1, G2, G3, G4, G5) - Shed at MCA/REV first: GS - Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.31 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G3 > 0. - Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.
5L81 and 5L83	G1 = 3.22 * [5L44 MDN + 0.11 * (5L81 + 5L83) NIC - 5L44_Over_Rating] G2 = 3.71 * [5L82 NIC + 0.44 * (5L81 + 5L83) NIC - 5L82_Over_Rating] G3 = 3.05 * [5L87 NIC + 0.43 * (5L81 + 5L83) NIC - 5L87_Over_Rating] G4 = 6.1 * [2L112 NLY + 0.07 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW] G5 = 4.26 * [2L293 SEL + 0.07 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW] GS = Max (0, G1, G2, G3, G4, G5) - Shed at MCA/REV first: GS - Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.26 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding. - Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

CONTINGENCY	SHEDDING REQUIREMENTS
5L82 and 5L83	G1 = 6.7 * [5L42 KLY + 0.27 * (5L82 + 5L83) NIC - 5L42_Over_Rating] G2 = 3.8 * [5L81 NIC + 0.44 * (5L82 + 5L83) NIC - 5L81_Over_Rating] G3 = 2.9 * [5L87 NIC + 0.48 * (5L82 + 5L83) NIC - 5L87_Over_Rating] G4 = 6.7 * [2L112 NLY + 0.06 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW] G5 = 4.8 * [2L293 SEL + 0.07 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW] GS = Max (0, G1, G2, G3, G4, G5) • Shed at MCA/REV first: GS • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.45 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding. • Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L76 and 5L79	IF (5L76 + 5L79) ACK > 750 MW, then
	• Arm DTT 1L209 except for 1L209 radial connection, and
	• Arm DTT1L214 RAS, and
	• Arm DTT FBC's 48L if VAS-VNT loop is open and VAS-WTS loop is closed, and
	• Apply the following generation shedding rules
	    GS = 1.25 * [(5L76 + 5L79) ACK + 5L98 VAS - 1400]
	    If 2L112 NLY < 0, shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS
	
	    If 2L112 NLY >= 0 , shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
	    (5L76 + 5L79) ACK + Z + 1L214 VNT + W,
	    where Z = 1L209 SAM if 1L209 is not radial, or
	        Z = 0 if 1L209 is radial
	        W = 48L KET if DTT 48L is armed, or
	        W = 0 if DTT 48L is nor armed.
	The total armed generation shedding amount must be limited to 2500 MW
	
	If generation shedding is armed, then
	• Arm DTT ACK 5CX1 if ACK 5CX1 is in service.
	• Arm DTT ACK 5CX2 if ACK 5CX2 is in service.
	• Keep a minimum of 1 REV, 1 SEV, 1 KCL and 1/3 equiv. SEV units on line post-shedding, or keep a minimum of 1 REV, 1 SEV and 1 equiv. SEV units on line post-shedding if the whole KCL plant is shutdown in pre-contingency condition.
	
	Note: 5L94 may be tripped by under-voltage protection scheme installed at CBK station after SI has high generation shedding.

5L87	No shedding required.

5L91 and 5L96	• Arm DTT 2L112 RAS
	• Arm DTT 48L RAS if VAS-WTS loop is closed.
	• Shed at KCL/ALH/SEV/WAN/BRX/WAX:
	    5L91 SEL + 5L96 SEL + 2L112 NLY + Z + (BC/AB transfer) – 100 MW
	• If generation shedding is armed, keep a minimum of 1 SEV unit or 1 KCL unit on-line post-shedding.
	Where:
	    Z = 48L KET if VAS-WTS loop is closed, or
	    Z = 0 if VAS-WTS loop is open.

CONTINGENCY	SHEDDING REQUIREMENTS

5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81_Over_Rating)
	GS2 = 12.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 31 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.11* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.1 * M
	
	If Y > NLYPST_OL_PickupMW,
	    R1 = 0.37 * (Y - NLYPST_OL_ResetMW)
	    R3 = 0.09 * (Y - NLYPST_OL_ResetMW)
	    R5 = 0.04 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	    R2 = 0.45 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.11 * (Z - 2L293OLRAS_ResetMW)
	    R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➢ D1 * (GS1 + 3.5* Ra)
	  ➢ D2 * (GS2 + 12.5* Rb)
	  ➢ D3 * (GS3 + 31* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.5 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.05 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN,
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation.

5L91	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.35 * (5L91 SEL+5L96 SEL – Y) MW, or
	  ➢ 3.16 * (2L112 NLY + 0.19 * 5L91 SEL – 400), or
	  ➢ 2.60 * (2L293 SEL + 0.23 * 5L91 SEL – 400), and do not shed WAN for this requirement.
	  Y = 1700 if SEL T1 & (T2 or/and) & T4 are in service, or
	  Y = 1635 if SEL T1 or (T2 & T3) or T4 is O.O.S.

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25 * (5L91 SEL+5L96 SEL + Z – Y), or
	  ➢ 2.30 * (2L112 NLY + BDY GEN + 0.24*(5L96 SEL + Z) – 1100)
	  ➢ 2.30 * (2L112 NLY + 0.24 * (5L96 SEL + Z) – 400), or
	  ➢ 2.66 * (2L293 SEL + 0.19 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	  Y = 2020 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1800 if none of ACK 5CX1 & 5CX2 is in service
	  Z = 48L KET if DTT 48L is armed, or
	  Z = 0 if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.18 * (5L91 SEL + 5L98 VAS – Y)
	  ➢ 3.10 * (2L112 NLY + 0.17 * 5L98 VAS – 400), or
	  ➢ 4.36 * (2L293 SEL + 0.15 * 5L98 VAS – 400), and do not shed WAN for this requirement.
	  Y = 1970 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1880 if none of ACK 5CX1 & 5CX2 is in service
	Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.14 * (5L91 SEL + 5L98 VAS – Y)
	  ➢ 3.48 * (2L112 NLY + 0.20 * 5L98 VAS – 400), or
	  ➢ 4.00 * (2L293 SEL + 0.18 * 5L98 VAS – 400), and do not shed WAN for this requirement.
	  Y = 2050 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1930 if none of ACK 5CX1 & 5CX2 is in service.

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25 * (5L91 SEL+5L96 SEL +Z – Y), or
	  ➢ 2.60 * (2L112 NLY + BDY GEN + 0.27 * (5L96 SEL + Z) – 1190), or
	  ➢ 2.60 * (2L112 NLY + 0.27 * (5L96 SEL + Z) – 400), or
	  ➢ 3.02 * (2L293 SEL + 0.21 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	  Y = 1990 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1720 if none of ACK 5CX1 & 5CX2 is in service
	  Z = 48L KET if DTT 48L is armed, or
	  Z = 0 if DTT 48L is not armed

5L94	(Note: Arming requirements for DTT 1L274 and DTT 1L275 are included in SOO 7T-17.) • If (BC to US + BC to AB) > 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: (BC to AB) MW
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.24 - 5L94 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Note 2 in Section 2
- 5L87 contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 5600 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.
- 5L91 and 5L96 contingency:
  If SEL 5RX3 is available, then limit:
  (FBC injection into SEL area) < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 350 + Y - Z,
  Otherwise, limit:
  (FBC injection into SEL area) < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 350 – 1 SEV@MIN_MW + Y – Z

  Where: FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL MW –
  60L227 KCL – 2L286 SEL MW
  FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW

  Y = AB to BC MW if AB to BC > 0 MW, or
  Y = 0 if AB to BC <= 0 MW
  Z = 48L KET if VAS-WTS loop is closed, or
  Z = 0 if VAS-WTS loop is open.

Generation Shedding Requirements
5L94 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this Table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F

5L76	ACK 5CB8 is in service: No gen shedding
	
	ACK 5CB8 is O.O.S.: (5L76 contingency will trip open 5L75)
	• Shed at REV: 1.03 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 3915) MW
	   AND
	   If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.

5L79	No generation shedding
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.

CONTINGENCY	SHEDDING REQUIREMENTS

5L81 and 5L82	G1 = 3.12 * [5L44 MDN + 0.14 * (5L81 + 5L82) NIC - 5L44_Over_Rating]
	G2 = 3.38 * [5L83NIC + 0.48 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G3 = 3.18 * [5L87 NIC + 0.42 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	G4 = 6.31 * [2L112 NLY + 0.07 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G5 = 6.08 * [2L293 SEL + 0.06 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	Arming condition for DTT 1L274 and DTT 1L275:
	    With Both NTL T1 and T2 in service,
	        If (1L274 + 1L275) NTL - 0.0733 * GS < - 92, arm DTT 1L274 and DTT 1L275;
	
	    With one of NTL T1 and T2 OOS,
	        If (1L274 + 1L275) NTL - 0.0733 * GS < - 46, arm DTT 1L274 and DTT 1L275;
	
	If DTT 1L274 and DTT 1L275 are not armed, then
	  • Shed at MCA/REV first: GS
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.30 * (GS – the armed gen-shedding amount at MCA/REV).
	    Do not select GMS/PCN for shedding if G3 > 0.
	  • Total armed generation shedding must be limited to 2500 MW.
	
	If the arming conditions for DTT 1L274 and DTT 1L275 are met, then
	
	G1 = 2.86 * [5L44MSN + 0.14 * (5L81+5L82) NIC - 5L44_Over_Rating]
	G2 = 3.12 * [5L83NIC + 0.47 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G3 = 2.48 * [5L87NIC + 0.42 * (5L81+5L82) NIC - 5L87_Over_Rating]
	G4 = 5.32 * [2L112 NLY + 0.07 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G5 = 5.76 * [2L293SEL + 0.06 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	  • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	  • Shed at MCA/REV first: GS
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.24 * (GS – the armed gen-shedding amount at MCA/REV).
	    Do not select GMS/PCN for shedding if G3 > 0.
	  • Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 3.28 * [5L44 MDN + 0.12 * (5L81 + 5L83) NIC - 5L44_Over_Rating]
	G2 = 3.76 * [5L82 NIC + 0.44 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G3 = 3.13 * [5L87 NIC + 0.43 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 6.3 * [2L112 NLY + 0.07 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 6.1 * [2L293 SEL + 0.06 * (5L81 + 5L83) NIC - 2L293_OL_RAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	Arming condition for DTT 1L274 and DTT 1L275:
	    With Both NTL T1 and T2 in service,
	      If (1L274 + 1L275) NTL - 0.0733 * GS < - 92, arm DTT 1L274 and DTT 1L275;
	    With one of NTL T1 and T2 OOS,
	      If (1L274 + 1L275) NTL - 0.0733 * GS < - 46, arm DTT 1L274 and DTT 1L275;
	
	If DTT 1L274 and DTT 1L275 are not armed, then
	  • Shed at MCA/REV first: GS
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.31 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding.
	  • Total armed generation shedding must be limited to 2500 MW.
	
	If the arming conditions for DTT 1L274 and DTT 1L275 are met, then
	
	G1 = 3.0 * [5L44 MDN + 0.12 * (5L81 + 5L83) NIC - 5L44_Over_Rating]
	G2 = 3.46 * [5L82 NIC + 0.44 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G3 = 2.45 * [5L87 NIC + 0.43 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 5.3 * [2L112 NLY + 0.07 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 5.78 * [2L293 SEL + 0.06 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	  • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	  • Shed at MCA/REV first: GS
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.22 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding.
	  • Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 3.73 * [5L81 NIC + 0.4 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G2 = 3.14 * [5L87 NIC + 0.47 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G3 = 6.45 * [2L112 NLY + 0.07 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G4 = 6.21 * [2L293 SEL + 0.06 * (5L82 + 5L83)NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	Arming condition for DTT 1L274 and DTT 1L275:
	    With Both NTL T1 and T2 in service,
	      If (1L274 + 1L275) NTL - 0.0733 * GS < - 92, arm DTT 1L274 and DTT 1L275;
	    With one of NTL T1 and T2 OOS,
	      If (1L274 + 1L275) NTL - 0.0733 * GS < - 46, arm DTT 1L274 and DTT 1L275;

CONTINGENCY	SHEDDING REQUIREMENTS
	• If DTT 1L274 and DTT 1L275 are not armed, then shed at MCA/REV first: GS • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.31 * (GS – the armed gen-shedding amount at MCA/REV). If G2 > 0, do not select GMS/PCN for shedding. • Total armed generation shedding must be limited to 2500 MW. If the arming conditions for DTT 1L274 and DTT 1L275 are met, then G1 = 3.34 * [5L81 NIC + 0.4 * (5L82 + 5L83) NIC - 5L81_Over_Rating] G2 = 2.47 * [5L87 NIC + 0.47 * (5L82 + 5L83) NIC -5L87_Over_Rating] G3 = 4.84 * [2L112 NLY + 0.07 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW] G4 = 5.63 * [2L293 SEL + 0.06 * (5L82 + 5L83) NIC -2L293OLRAS_PickupMW] GS = Max (0, G1, G2, G3, G4) • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7 T-17, and • Shed at REV/MCA first: GS • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.24 * (GS – the armed gen-shedding amount at REV+MCA). Do not select GMS/PCN for shedding if G2 > 0. • Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L76 and 5L79	If (5L76 + 5L79) ACK > 750 MW, then
	• Arm DTT 1L209 except for 1L209 radial connection, and
	• Arm DTT 1L214 , and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17
	• Arm DTT FBC's 48L if VAS-VNT loop is open and VAS-WTS loop is closed, and
	• Apply the following generation shedding rules
	If 2L112 NLY < 0, then
	    GS =1.2 * [(5L76 + 5L79) ACK + 5L98 VAS – 1L274 POC + 1L275 NTL - Y]
	• Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS
	    Y = 1300 if VAS-VNT loop is closed, or
	    Y = 1200 if VAS-VNT loop is open
	
	If 2L112 NLY >= 0, shed at REV fist, then KCL/ALH/SEV/WAN/BRX/WAX:
	(5L76 + 5L79) ACK + Z + 1L214 VNT – 1L274 POC + 1L275 NTL + W
	where Z = 1L209 SAM if 1L209 is not radial, or
	    Z = 0 if 1L209 is radial.
	    W = 48L KET if DTT 48L is armed, or
	    W = 0 if DTT 48L is not armed.
	
	The total armed generation shedding amount must be limited to 2500 MW + (BC_AB)
	
	If generation shedding is armed,
	• Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
	• Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and
	• keep a minimum of 1 REV, 1 SEV, 1 KCL and 1/3 equiv. SEV units on line post-shedding or keep a minimum of 1 REV, 1 SEV and 1 equiv. SEV units on line post-shedding if the whole KCL plant is shutdown in pre-contingency condition.

5L87	No shedding required.
5L91 and 5L96	• Arm DTT 48L RAS if VAS-WTS loop is closed. • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17 • Shed at KCL/ALH/SEV/WAN/BRX/WAX: 1.02 x (5L91 SEL + 5L96 SEL + Z) + 2L112 NLY – 1L274 POC + 1L275 NTL + 70 - Y Y is the lesser of: • 400 MW, or • 1200 - BDY gen MW Z = 48L KET if DTT 48L RAS is armed, or Z = 0 if DTT 48L RAS is not armed. KCL may be shed down to 0 MW. If SEL 5RX3 is available, then SEV may be shed down to 0 MW, otherwise keep a minimum of 1 SEV unit on line post shedding. Total armed generation shedding must be limited to: 2500 – 1L274 POC + 1L275 NTL • If TSA-PM alarms "insufficient shedding", the BC Hydro Control Centre staff must request FBC to reduce the generation of the BRD/COR/UBO/LBO/SLC, or/and the WAN unit not armed for shedding, or run one additional SEV unit as sync if SEL 5RX3 is unavailable.

CONTINGENCY	SHEDDING REQUIREMENTS

5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81_Over_Rating)
	GS2 = 12.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 31.0 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.11* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.1 * M
	
	If Y > NLYPST_OL_PickupMW,
	    R1 = 0.4 * (Y - NLYPST_OL_ResetMW)
	    R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	    R5 = 0.04 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	    R2 = 0.47 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.12 * (Z - 2L293OLRAS_ResetMW)
	    R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	D1 * (GS1 + 3.5* Ra)
	D2 * (GS2 + 12.5* Rb)
	D3 * (GS3 + 31.0* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.5 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.05 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L91	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.28 * (5L91 SEL + 5L96 SEL – Y), or ➢ 3.30 * (2L112 NLY + 0.20 * 5L91 SEL – 400), or ➢ 3.70 * (2L293 SEL + 0.19 * 5L91 SEL – 400), and do not shed WAN for this requirement. Y = 1715 if all SEL T1 & (T2 or/and T3) & T4 are in service, or Y = 1620 if SEL T1 or (T2 & T3) or T4 is O.O.S.
5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed. • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z – Y) ➢ 2.88 * (2L112 NLY + 0.21 * (5L96 SEL + Z) – 400), or ➢ 2.88 * (2L112 NLY + BDY Gen + 0.21 * (5L96 SEL + Z) – 1200), or ➢ 3.38 * (2L293 SEL + 0.15 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement. Y = 2080 if at least one of ACK 5CX1 & 5CX2 is in service, or Y = 1760 if none of ACK 5CX1 & 5CX2 is in service Z = 48L KET if DTT 48L is armed, or Z = 0 if DTT 48L is not armed
5L98	If VAS-VNT loop is closed, then • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.18 * (5L91 SEL + 5L98 VAS – Y), or ➢ 3.11 * (2L112 NLY + 0.17 * 5L98 VAS – 400), or ➢ 4.35 * (2L293 SEL + 0.14 * 5L98 VAS – 400), and do not shed WAN for this requirement. Y = 2000 if at least one of ACK 5CX1 & 5CX2 is in service, or Y = 1860 if none of ACK 5CX1 & 5CX2 is in service. Otherwise, • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.14 * (5L91 SEL + 5L98 VAS – Y), or ➢ 3.05 * (2L112 NLY + 0.20 * 5L98 VAS – 400), or ➢ 4.28 * (2L293 SEL + 0.16 * 5L98 VAS – 400), and do not shed WAN for this requirement. Y = 2080 if at least one of ACK 5CX1 & 5CX2 is in service, or Y = 1960 if none of ACK 5CX1 & 5CX2 is in service.
5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed. • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z – Y) ➢ 3.14 * (2L112 NLY + 0.24 * (5L96 SEL + Z) – 400), or ➢ 3.14 * (2L112 NLY + BDY Gen + 0.24 * (5L96 SEL + Z) – 1230), or ➢ 3.28 * (2L293 SEL + 0.17 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement. Y = 2050 if at least one of ACK 5CX1 & 5CX2 is in service, or Y = 1700 if none of ACK 5CX1 & 5CX2 is in service Z = 48L KET if DTT 48L is armed, or Z = 0 if DTT 48L is not armed
5L92	Arm DTT 2L112 RAS if • 2L293 NLY > 420 – 0.75 * 5L92 CBK, or • 2L293 SEL > 420 – 0.9 * 5L92 SEL
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.25 – 5L94 AND 5L96 O.O.S. (Any Status of VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit: 5L91 SEL < 1300 MW if none of ACK 5CX1 and 5CX2 is in service, or
  Limit: 5L91 SEL < 1400 MW if at least one of ACK 5CX1 and 5CX2 is in service
  If alarm comes, the Operator should reduce the flow on 5L91 by:
    - Reducing FBC's power injection into SEL, and/or
    - Reducing SEV / KCL generation, and/or
    - Adjusting NLY PST to increase 2L112 (NLY to BDY) transfer

- 5L76 and 5L79 contingency:

    - At least two of ACK 5RX4 and 5RX7 and 5RX8 must be available.

    - If VAS-VNT loop is closed, limit BDY Gen + 2L112 NLY < 1150 MW.
    - If VAS-VNT loop is open, limit BDY Gen + 2L112 NLY < 1050 MW.

- 5L91 contingency:

  If SEL 5RX3 is available, then limit:
     (FBC injection into SEL area) < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + Y + 350
  Otherwise, limit:
     (FBC injection into SEL area) < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + Y + 350 – 1 SEV@MIN_MW

  Where:

  FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW

   FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
   Y = AB to BC MW if AB to BC > 0 MW, or
   Y = 0 if AB to BC <= 0 MW

Generation Shedding Requirements
5L94 AND 5L96 O.O.S. (Any Status of VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	ACK 5CB8 in service: No gen shedding ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75) • Same as 5L75 (3P) contingency with ACK 5CB5 O.O.S. in this table
5L79	No gen shedding
5L81	Same as system normal Table 1.1.
5L82	Same as system normal Table 1.1.
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.

5L81 and 5L82	G1 = 3.29 * [5L44 MDN+ 0.13 * (5L81 + 5L82) NIC - 5L44_Over_Rating]
	G2 = 3.51 * [5L83 NIC + 0.49 * (5L81+ 5L82) NIC - 5L83_Over_Rating]
	G3 = 3.1 * [5L87 NIC+ 0.43 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	G4 = 7.04 * [2L112 NLY+ 0.07 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G5 = 6.29 * [2L293 SEL+ 0.06 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	Arming condition for DTT 1L274 and DTT 1L275:
	    With Both NTL T1 and T2 in service,
	    If (1L274 + 1L275) NTL - 0.0734 * GS < - 89, arm DTT 1L274 and DTT 1L275;
	
	    With one of NTL T1 and T2 OOS,
	    If (1L274 + 1L275) NTL - 0.0734 * GS < - 44.5, arm DTT 1L274 and DTT 1L275;
	
	If DTT 1L274 and DTT 1L275 are not armed, then
	  • Shed at MCA/REV first: GS
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.48 * (GS – the armed gen-shedding amount at MCA/REV).
	    Do not select GMS/PCN for shedding if G3 > 0.
	  • Total armed generation shedding must be limited to 2500 MW.
	
	If the arming conditions for DTT 1L274 and DTT 1L275 are met, then
	
	G1 = 3.02 * [5L44MDN + 0.14 * (5L81 + 5L82) NIC - 5L44_Over_Rating]
	G2 = 3.19 * [5L83NIC + 0.47 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G3 = 2.45 * [5L87NIC+ 0.43 * (5L81+ 5L82) NIC - 5L87_Over_Rating]
	G4 = 4.76 * [2L112 NLY + 0.07 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G5 = 6.98 * [2L293SEL + 0.06 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	  • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	  • Shed at MCA/REV first: GS
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.42 * (GS – the armed gen- shedding amount at MCA/REV).
	    Do not select GMS/PCN for shedding if G3 > 0.
	  • Total armed generation shedding must be limited to 2500 MW.

	If generation shedding is armed, • keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 KCL (with high side 2CBs in service) on line post-shedding if SEL 5RX3 is available, or • keep a minimum of 2 MCA, 1 REV, 2 SEV, 1 KCL (with high side 2CBs in service) and 1 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable, • keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or • keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition. If TSA alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions: 　If BC is exporting to US, then reduce BC to US export. 　If BC is importing from US, then 　　• reduce (SI and FBC) generation and increase Peace generation, or/and 　　• reduce (SI and FBC) generation and increase import from US.

5L81 and 5L83	G1 = 3.24 * [5L44 MDN + 0.11 * (5L81+5L83) NIC - 5L44_Over_Rating]
	G2 = 3.73 * [5L82 NIC + 0.43 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G3 = 3.05 * [5L87 NIC + 0.44 *(5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 7.04 * [2L112 NLY + 0.06 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 6.81 * [2L293 SEL + 0.06 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	Arming condition for DTT 1L274 and DTT 1L275:
	　With Both NTL T1 and T2 in service,
	　　If (1L274 + 1L275) NTL - 0.0734 * GS < - 89, arm DTT 1L274 and DTT 1L275;
	　With one of NTL T1 and T2 OOS,
	　　If (1L274 + 1L275) NTL - 0.0734 * GS < - 44.5, arm DTT 1L274 and DTT 1L275;
	
	If DTT 1L274 and DTT 1L275 are not armed, then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.56 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If the arming conditions for DTT 1L274 and DTT 1L275 are met, then
	
	G1 = 3.24 * [5L44 MDN + 0.11 * (5L81 + 5L83) NIC - 5L44_Over_Rating]
	G2 = 3.7 * [5L82 NIC + 0.44 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G3 = 2.49 * [5L87 NIC + 0.44 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 4.89 * [2L112 NLY + 0.07 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 7.08 * [2L293 SEL + 0.06 * (5L81 + 5L83) NIC - 2L293_OL_RAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7 T-17, and
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.42 * (GS – the armed gen- shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G3 > 0.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed,
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 KCL (with high side 2CBs in service) on line post-shedding if SEL 5RX3 is available, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV, 1 KCL (with high side 2CBs in service) and 1 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or
	• keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition.
	
	If TSA alarms "C5L81_83 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	　If BC is exporting to US, then reduce BC to US export.
	　If BC is importing from US, then
	　　• reduce (SI and FBC) generation and increase Peace generation, or/and
	　　• reduce (SI and FBC) generation and increase import from US.

5L82 and 5L83	G1 = 3.90 * [5L81 NIC + 0.43 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G2 = 3.07 * [5L87 NIC + 0.48 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G3 = 7.25 * [2L112 NLY + 0.06 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G4 = 6.48 * [2L293 SEL + 0.06 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	Arming condition for DTT 1L274 and DTT 1L275:
	　With Both NTL T1 and T2 in service,
	　　If (1L274 + 1L275) NTL - 0.0734 * GS < -89, arm DTT 1L274 and DTT 1L275;
	　With one of NTL T1 and T2 OOS,
	　　If (1L274 + 1L275) NTL - 0.0734 * GS < -44.5, arm DTT 1L274 and DTT 1L275;
	
	If DTT 1L274 and DTT 1L275 are not armed, then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.49 * (GS – the armed gen-shedding amount at MCA/REV). If G2 > 0, do not select GMS/PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If the arming conditions for DTT 1L274 and DTT 1L275 are met, then
	
	G1 = 3.67 * [5L81 NIC + 0.39 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G2 = 2.5 * [5L87 NIC+ 0.48 * (5L82 + 5L83) NIC -5L87_Over_Rating]

	G3 = 4.99 * [2L112 NLY + 0.07 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW] G4 = 7.29 * [2L293 SEL + 0.06 * (5L82 + 5L83) NIC - 2L293_OLRAS_PickupMW] GS = Max (0, G1, G2, G3, G4) • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7 T-17, and • Shed at MCA/REV first: GS • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.44 * (GS – the armed gen- shedding amount at MCA/REV). • Do not select GMS/PCN for shedding if G2 > 0. • Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, • keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 KCL (with high side 2CBs in service) on line post-shedding if SEL 5RX3 is available, or • keep a minimum of 2 MCA, 1 REV, 2 SEV, 1 KCL (with high side 2CBs in service) and 1 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable, or • keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is available and the whole KCL plant is shutdown in pre-contingency condition, or • keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on-line post-shed if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition. If TSA alarms "C5L82_83 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions: If BC is exporting to US, then reduce BC to US export. If BC is importing from US, then • reduce (SI and FBC) generation and increase Peace generation, or/and • reduce (SI and FBC) generation and increase import from US.

5L76 and 5L79	• Arm DTT 1L209 except for 1L209 radial connection, and
	• Arm DTT 1L214, and
	• Arm DTT 1L274, 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Arm DTT 48L RAS if VAS-WTS loop is closed, and
	• If 2L112 NLY >= 0, shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
	    (5L76 + 5L79) ACK + 1L214 VNT – 1L274 POC + 1L275 NTL + Z + U
	OR
	  • If 2L112 NLY < 0, Arm DTT 73L RAS if VAS-VNT loop is closed, and
	  • Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
	    (5L76 + 5L79) ACK+ 1L214 VNT + 2L112 NLY – 1L274 POC + 1L275 NTL + Z + U - W
	
	Where: Z = 1L209 SAM if 1L209 is not radial, or
	    Z = 0 if 1L209 is radial
	    U = 48L KET if DTT 48L RAS is armed, or U = 0 if DTT 48L RAS is not armed.
	    W = 73L RGA if DTT 73L RAS is armed, or W = 0 if DTT 73L RAS is not armed.
	
	• If Generation shedding is armed , then
	  • Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
	  • Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and
	  • keep a minimum of 1 REV, 1 SEV and 1 KCL units on-line post-shedding or keep a minimum of 1 REV, 1 SEV and 2/3 equiv. SEV units on-line post-shedding if the whole KCL plant is shutdown in pre-contingency condition.
	• The total armed generation shedding amount must be limited to 2500 + (BC_AB) MW
	If TSA-PM alarms "insufficient shedding", the BC Hydro Control Centre staff must reduce the generation of the units not armed for shedding, or run as sync.

5L87	No shedding required.
5L44	Same as Table 1.24 – 5L94 O.O.S.

5L91
(TSA-PM must use "5L91 AND 5L96" because "5L91" signal won't be generated as long as 5L96 O.O.S.)
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17
	• Arm DTT 48L RAS if VAS-WTS loop is closed
	• Shed at KCL/ALH/SEV/WAN/BRX/WAX:
	  1.02 x (5L91 SEL + 5L96 SEL) + 2L112 NLY – 1L274 POC + 1L275 NTL + 70 - Y + Z
	  Y is the lesser of:
	  • 400 MW, or
	  • 1200 - BDY gen MW
	  Z = 48L KET if DTT 48L RAS is armed, or Z = 0 if DTT 48L RAS is nor armed.
	
	  KCL may be shed down to 0 MW. If SEL 5RX3 is available, then SEV may be shed down to 0 MW, otherwise keep a minimum of 1 SEV unit on line post shedding.
	• If TSA-PM alarms "insufficient shedding", the BC Hydro Control Centre staff must request FBC to reduce the generation of the BRD/COR/UBO/LBO/SLC, or/and the WAN unit not armed for shedding, or run one additional SEV unit as sync if SEL 5RX3 is unavailable.

5L98 (TSA-PM must treat it as "5L96 AND 5L98" contingency because "5L98" signal won't be generated as long as 5L96 O.O.S.)	Note: When both VAS-WTS and VAS-VNT loops are open, 5L98 contingency with 5L96 already out of service will black out the FBC's loads which are radially connected to VAS. When VAS-VNT loop is open and VAS-WTS loop is closed, 5L98 contingency may cause overloading on ASM T1/T2, or voltage instability in the area which is radially supplied from WTS. No shedding required.

5L92	• Arm DTT 2L112 RAS if
	  ➢ 2L293 NLY > 420 – 0.75 * 5L92 CBK, or
	  ➢ 2L293 SEL > 420 – 0.9 * 5L92 SEL

Bypass GUI 5CX1	No shedding required
5L91 (1P) or 5L98 (1P)	No shedding required.

Table 1.26 - 2L112 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- 5L91 and 5L96 contingency:
  - Limit: 5L91 SEL + 5L96 SEL + Z < 2500 MW
  - If SEL 5RX3 is available, then limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW - Z

    Otherwise, limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW – 1 KCL @ MIN.MW - Z

    Where: FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL – 60L227 KCL – 2L286 SEL MW

    FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW

    Y = AB to BC MW if AB to BC > 0, or

    Y = 0 if AB to BC <= 0

    Z = 48L KET if VAS-WTS loop is closed, or

    Z = 0 if VAS-WTS loop is open.
  - Alarm if 5L91 SEL + 5L96 SEL + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
    If 5L91 SEL + 5L96 SEL + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW

    If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91 and 5L96.

Generation Shedding Requirements
2L112 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this Table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	ACK 5CB8 in service: If REV Gen <= 2000 MW, shed at REV: 1.02 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4215) MW ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75) Shed at REV: • 1.02 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 3765) MW if REV Gen <= 1500 MW, or • 1.02 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4010) MW if 1500 < REV Gen <= 2000 MW AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service.
5L81	Shed at MCA/REV: 2.14 * (5L44 MDN + 0.62 * 5L81 NIC - 5L44_Over_Rating)
5L82	No shedding required
5L83	No shedding required.
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.

5L81 and 5L82	G1 = 2.79 * [5L44 MDN + 0.16 * (5L81 + 5L82) NIC - 5L44_Over_Rating]
	G2 = 3.0 * [5L83 NIC + 0.49 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G3 = 2.7 * [5L87 NIC + 0.44 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	
	GS = Max (0, G1, G2, G3)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.1 *[0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G3 > 0.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	• Shed at MCA/REV: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.1 * (GS– the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G3 > 0.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 2.83 * [5L44 MDN + 0.12 * (5L81+5L83) NIC - 5L44_Over_Rating]
	G2 = 3.28 * [5L82 NIC + 0.45 * (5L81 + 5L83) NIC - 5L82_Over_Rrating]
	G3 = 2.66 * [5L87 NIC + 0.46 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	
	GS = Max (0, G1, G2, G3)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.1 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	• Shed at MCA/REV: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.1 * (GS– the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

CONTINGENCY	SHEDDING REQUIREMENTS

5L82 and 5L83	G1 = 5.8 * [5L42 KLY + 0.28 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G2 = 3.2 * [5L81 NIC + 0.46 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 2.5 * [5L87 NIC + 0.50 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	
	GS = Max (0, G1, G2, G3)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.22 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	• Shed at MCA/REV: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.22 * (GS– the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L76 and 5L79	If (5L76+5L79) ACK > 900 MW, then
	• Arm DTT 1L209 except for 1L209 radial connection, and
	• Arm DTT 1L214 RAS , and
	• Arm DTT FBC's 48L if VAS-VNT loop is open and VAS-WTS loop is closed.
	• Apply the following generation shedding rules.
	
	If AB to BC < 0, shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
	    1.10 * [(5L76 + 5L79) ACK + 5L98 VAS – 1250], or
	
	If AB to BC >= 0, GS = 1.10 * [(5L76 + 5L79) ACK + 5L98 VAS – 900]
	If AB to BC > 400 AND GS > 1500, then
	• Arm DTT 5L94 RAS, and
	• Arm DTT 1L274 and DTT 1L275 RAS except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX:
	    (5L76 + 5L79) ACK + 5L98 VAS - 700 – Import from AB
	Otherwise
	• Shed at REV first, then KCL/ALH/SEV/WAN/BRX/WAX: GS
	
	The total armed generation shedding amount must be limited to 2500 MW If DTT 5L94 is not armed, or
	(the total armed generation shedding amount + AB to BC) must be limited to 2500 MW If DTT 5L94 is armed.
	If generation shedding is armed, then
	• Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
	• Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and
	• keep a minimum of 1 REV, 1 KCL, 1 SEV and 1/3 equiv. SEV units on line post-shedding or keep a minimum of 1 REV, 1 SEV and 1 equiv. SEV units on-line post-shedding if the whole KCL plant is shutdown in pre-contingency condition.

5L87	No shedding required.
5L91 & 5L96	Tables A, B, C and D are applicable to this contingency with the exception that arming DTT 2L112 RAS is not required.

5L44	GS1 = 3 * (5L81NIC + 0.35 * 5L44MDN – 5L81_Over_Rating)
	GS2 = 11.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 29.5 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➤ D1 * GS1
	  ➤ D2 * GS2
	  ➤ D3 * GS3
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.5 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.05 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L91	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV: 1.10 * (5L91 SEL+5L96 SEL – Y)
	    Y = 1535 if SEL T1 & (T2 or/and T3) & T4 are in service, or
	    Y =1480 if SEL T1 or (T2 & T3) or T4 is O.O.S.

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW and if VAS-WTS loop is closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV:
	  ➤ 1.05 * (5L91 SEL + 5L96 SEL + Z – Y)
	    Y = 1620 if at least one of ACK 5CX1 & 5CX2 is in service, or
	    Y = 1500 if none of ACK 5CX1 & 5CX2 is in service
	    Z = 48L KET if DTT 48L is armed, or
	    Z = 0 if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then:

CONTINGENCY	SHEDDING REQUIREMENTS

	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV: 1.16 * (5L91 SEL + 5L98 VAS – Y)
	    Y = 1650 if at least one of ACK 5CX1 & 5CX2 is in service, or
	    Y = 1500 if none of ACK 5CX1 & 5CX2 is in service
	Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV: 1.05 * (5L91 SEL + 5L98 VAS – Y)
	    Y = 1680 if at least one of ACK 5CX1 & 5CX2 is in service, or
	    Y = 1540 if none of ACK 5CX1 & 5CX2 is in service

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW and if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV: 1.05 * (5L91 SEL + 5L96 SEL + Z – Y)
	    Y = 1720 if at least one of ACK 5CX1 & 5CX2 is in service, or
	    Y = 1490 if none of ACK 5CX1 & 5CX2 is in service
	    Z = 48L KET if DTT 48L is armed, or
	    Z = 0 if DTT 48L is not armed

5L92	(Note: Arming requirements for DTT 5L94, DTT 1L274 and DTT 1L275 are included in SOO 7T-17.) No DTT and shedding required.
5L94	(Note: Arming requirements for DTT 1L274 and DTT 1L275 are included in SOO 7T-17.) • If (BC to US + BC to AB) > 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: (BC to AB) MW • If 700 MW < (BC to US + BC to AB) <= 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: (BC to AB) – 400 MW • If generation shedding is armed, keep a minimum of 2 REV, 2 SEV, 1 KCL and 1/3 equivalent SEV units on-line post-shedding, or keep a minimum of 2 REV, 2 SEV and 1 equivalent SEV units on-line post-shedding if the whole KCL is shutdown in pre-contingency condition.
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.27 - 2L293 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Note 3 in Section 2

- 5L91 or 5L96 or 5L98 or (5L96 AND 5L98) contingency: Limit: 2L112 NLY + BDY gen MW < 1100 MW
- 5L92 contingency:
  - When 0 <= BC to AB <= 100, or 0 < AB to BC < AAL/CBK/NTL load, then
    - ➤ Limit 2L112 NLY < 370 - 2L294 NLY - 0.5 * 5L92 SEL
    - ➤ Limit 62L WTS to ESS < 270 – 0.5 * 5L92 SEL
  - When BC to AB > 100, or AB to BC > AAL/CBK/NTL load, then
    - ➤ Limit: 2L112 NLY < 370 - 2L294 NLY - 0.48 * 5L92 SEL + 0.35 * (BC-AB)
    - ➤ Limit: 62L WTS < 270 - 0.46 * 5L92 SEL + 0.34 * (BC-AB)
  - If above 62L WTS to ESS limit is exceeded, then
    - ➤ reduce BRD generation and increase WAN generation, or
    - ➤ reduce 2L112 NLY, or
    - ➤ reduce BC to AB transfer.
  - (Note: the AAL/CBK/NTL load = 2L294 NLY + CBK 500 kV to 230 kV MW + 1L274 POC – 1L275 NTL MW)

Generation Shedding Requirements
2L293 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this Table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	ACK 5CB8 in service: If REV Gen <= 2000 MW, shed at REV: 1.15 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4220) MW ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75) Shed at REV: • 1.02 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 3810) MW if REV Gen <= 1500 MW, or • 1.14 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 3940) MW if 1500 < REV Gen <= 2000 MW, or • 1.14 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4150) MW if REV Gen > 2000 MW AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service.
5L81	Shed at MCA/REV: GS + 3.53 * M Where GS and M are calculated as follows: GS = Max (0, 2.36 * (5L44 MDN + 0.62 * 5L81 NIC - 5L44_Over_Rating)) Y = 2L112 NLY + 0.02 * 5L81 NIC - 0.10 * GS If Y > NLYPST_OL_PickupMW, M = 0.53 * (Y – NLYPST_OL_ResetMW), Else M = 0
5L82	No shedding required.
5L83	No shedding required.
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.

5L81 and 5L82	G1 = 2.99 * [5L44 MDN + 0.15 * (5L81 + 5L82) NIC - 5L44_Over_Rating]
	 G2 = 3.25 * [5L83 NIC + 0.47 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	 G3 = 2.96 * [5L87 NIC + 0.43 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	 G4 = 10.04 * [2L112NLY + 0.05 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	
	 GS = Max (0, G1, G2, G3, G4)
	
	 If AB to BC >= 500 MW AND GS >= 1500 MW, then
	 • Arm DTT 5L94, and
	 • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	 • Shed at MCA/REV: 0.93 * (GS – AB to BC)
	 • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.25 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G3 > 0.
	 • Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	 If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	 • Shed at MCA/REV: GS
	 • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.25 * (GS– the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G3 > 0.
	 • Total armed generation shedding must be limited to 2500 MW.
	
	 If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

CONTINGENCY	SHEDDING REQUIREMENTS

5L81 and 5L83	G1 = 3.14 * [5L44 MDN + 0.12 * (5L81 + 5L83) NIC - 5L44_Over_Rating]
	G2 = 3.63 * [5L82 NIC + 0.44 * (5L81 + 5L83) NIC – 5L82_Over_Rating]
	G3 = 2.83 * [5L87 NIC + 0.44 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 10.08 * [2L112NLY + 0.05 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.24 *[0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	• Shed at MCA/REV: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.24 * (GS– the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 6.6 * [5L42 KLY + 0.27 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G2 = 3.2 * [5L81 NIC + 0.45 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 2.9 * [5L87 NIC + 0.48 * (5L82+5L83) NIC - 5L87_Over_Rating]
	G4 = 12.5 * [2L112 NLY + 0.03 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.24 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	• Shed at MCA/REV: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.24 * (GS– the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L76 and 5L79	
	
	IF (5L76 + 5L79) ACK > 750 MW , then
	• Arm DTT 1L209 except for 1L209 radial connection, and
	• Arm DTT 1L214, and
	• Arm DTT FBC's 48L if VAS-VNT loop is open and VAS-WTS loop is closed, and
	• Apply the above generation shedding rules
	Z and W value in the above shedding formulas:
	• Z = 1L209 SAM if 1L209 is not radial, or Z = 0 if 1L209 is radial
	• W = 48L KET if DTT 48L is armed, or W = 0 if DTT 48L is not armed.
	The total armed generation shedding amount must be limited to 2500 MW If DTT 5L94 is not armed, or (the total armed generation shedding amount + AB to BC) must be limited to 2500 MW If DTT 5L94 is armed
	If generation shedding is armed, then
	• Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
	• Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and
	• Keep a minimum of 1 REV, 1 SEV, 1 KCL and 1/3 equiv. SEV units on-line post-shedding or keep a minimum of 1 REV, 1 SEV and 1 equiv. SEV units on-line post-shed if the whole KCL plant is shutdown in pre-contingency condition.

5L87	No shedding required.
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency

CONTINGENCY	SHEDDING REQUIREMENTS

5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81_Over_Rating)
	GS2 = 12.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 31.5* (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➢ D1 * GS1
	  ➢ D2 * GS2
	  ➢ D3 * GS3
	
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.5 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.05 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation.

5L91	• Shed at KCL/ALH/BRX/WAX/SEV (select SEV for shed last): 1.10 * (5L91 SEL + 5L96 SEL – 1580) and • Shed at WAN: 2.30 * (2L112 NLY + 0.11 * 5L91 SEL – 400 – 0.18 * (armed KCL/ALH/BRX/WAX/SEV shedding amount for the contingency))

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed.
	• Shed at WAN the greater:
	  ➢ 2.05 * (2L112 NLY + 0.17 * (5L96 SEL + Z) – 400)
	  ➢ 2.05 * (2L112 NLY + 0.17 * (5L96 SEL + Z) + BDY GEN – 1180)
	GS = Armed WAN shedding amount for this contingency.
	• Shed at KCL/ALH/BRX/WAX, then SEV the greatest of:
	  ➢ 1.20 * (5L91 SEL + 5L96 SEL + Z – Y – 0.48 * GS)
	  ➢ 3.74 * (2L112 NLY + 0.17 * (5L96 SEL + Z) – 0.49 * GS - 400)
	  ➢ 3.74 * (2L112 NLY + 0.17 * (5L96 SEL + Z) + BDY Gen – 0.49 * GS – 1180)
	Y = 1990 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1830 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L is armed, or
	Z = 0 if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then
	• Shed at WAN:
	  2.19 * (2L112 NLY + 0.13 * 5L98 VAS – 400) GS = Armed WAN shedding amount for this contingency.
	• Shed at KCL/ALH/BRX/WAX, then SEV the greater of:
	  • 1.17 * (5L91 SEL + 5L98 VAS – Y – 0.50 * GS)
	  • 4.32 * (2L112 NLY + 0.13 * 5L98 VAS – 0.45 * GS – 400)
	
	  Y = 1790 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1600 if none of ACK 5CX1 & 5CX2 is in service
	
	If VAS-VNT loop is open, then
	• Shed at WAN: 2.16 * (2L112 NLY + 0.16 * 5L98 VAS – 400)
	GS = Armed WAN shedding amount for this contingency.
	• Shed at KCL/ALH/BRX/WAX, then SEV the greater of:
	  • 1.14 * (5L91 SEL + 5L98 VAS – Y – 0.51 * GS)
	  • 4.12 * (2L112 NLY + 0.16 * 5L98 VAS – 0.46 * GS – 400)
	  Y = 1790 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1590 if none of ACK 5CX1 & 5CX2 is in service

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at WAN the greater of:
	  ➢ 2.12 * (2L112 NLY + 0.20 * (5L96 SEL + Z) – 400)
	  ➢ 2.12 * (2L112 NLY + 0.20 * (5L96 SEL + Z) + BDY GEN – 1200)
	GS = Armed WAN shedding amount for this contingency.
	• Shed at KCL/ALH/BRX/WAX, then SEV:
	  ➢ 1.20 * (5L91 SEL + 5L96 SEL + Z – Y – 0.48 * GS)
	  ➢ 3.74 * (2L112 NLY + 0.20 * (5L96 SEL + Z) – 0.44 * GS - 400)
	  ➢ 3.74 * (2L112 NLY + 0.20 * (5L96 SEL + Z) + BDY Gen – 0.44 * GS – 1200)
	  Y = 1960 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1800 if none of ACK 5CX1 & 5CX2 is in service
	  Z = 48L KET if DTT 48L is armed, or
	  Z = 0 if DTT 48L is not armed

5L92	(Note: Arming requirements for DTT 5L94, DTT 1L274 and DTT 1L275 are included in SOO 7T-17.) • If 0 <= BC to AB <= 100, or 0 < AB to BC <= AAL/CBK/NTL load, then Shed at WAN: 2.3 * (62L ESS - 0.43 * 5L92 SEL – 270) • If BC to AB > 100, then shed at WAN: 2.3 * (62L ESS – 0.42 * 5L92 SEL + 0.3 * (BC-AB) - 270) • If AB to BC > AAL/CBK/NTL load, then shed at WAN: 2.3 * (62L ESS - 0.31 * 5L92 SEL + 0.15 * (BC-AB) – 270) (Note: the AAL/CBK/NTL load = 2L294 NLY +CBK 500kV to 230 kV MW + 1L274 POC – 1L275 NTL MW)
5L94	(Note: Arming requirements for DTT 1L274 and DTT 1L275 are included in SOO 7T-17.) • If (BC to US + BC to AB) > 2400 MW, then shed at KCL/SEV/ALH/BRX/REV/WAX: (BC to AB) MW • If 700 MW < (BC to US + BC to AB) <= 2400 MW, then shed at KCL/SEV/ALH/BRX/REV/WAX: (BC to AB) – 400 MW • If generation shedding is armed, keep a minimum of 2 REV, 2 SEV, 1 KCL and 1/3 equivalent SEV units on-line post-shedding, or keep a minimum of 2 REV, 2 SEV and 1 equivalent SEV units on-line post-shedding if the whole KCL is shutdown in pre-contingency condition.
Bypass GUI 5CX1	No shedding required.

CONTINGENCY	SHEDDING REQUIREMENTS
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.28 - 2L294 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
2L294 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table A
5L79	Same as Table A
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L76 and 5L79	Same as Table 1.27_2L293 O.O.S.
5L87	Same as system normal Table 1.1
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as system normal Table 1.1

5L91	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ❯ $1.23 * (5L91\ SEL + 5L96\ SEL - Y)$, or
	    ❯ $3.55 * (2L112\ NLY + 0.18 * 5L91\ SEL - 400)$, or
	    ❯ $4.25 * (2L293\ SEL + 0.19 * 5L91\ SEL - 400)$, and do not shed WAN for this requirement.
	 $Y = 1790$ if all SEL T1 & (T2 or/and T3) & T4 are in service, or
	 $Y = 1730$ if SEL T1 or (T2 & T3) or T4 is O.O.S.

5L96	- Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed. - Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ❯ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or
	    ❯ $2.40 * (2L112\ NLY + 0.24 * (5L96\ SEL + Z) - 400)$, or
	    ❯ $2.40 * (2L112\ NLY + BDY\ Gen + 0.24 * (5L96\ SEL + Z) - 1150)$, or
	    ❯ $2.77 * (2L293\ SEL + 0.19 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement.
	 $Y = 2140$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	 $Y = 1830$ if none of ACK 5CX1 & 5CX2 is in service
	 $Z = 48L\ KET$ if DTT 48L is armed, or
	 $Z = 0$ if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then - Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ❯ $1.17 * (5L91\ SEL + 5L98\ VAS - Y)$, or
	    ❯ $3.12 * (2L112\ NLY + 0.17 * 5L98\ VAS - 400)$, or
	    ❯ $4.35 * (2L293\ SEL + 0.15 * 5L98\ VAS - 400)$, and do not shed WAN for this requirement.
	 $Y = 1960$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	 $Y = 1840$ if none of ACK 5CX1 & 5CX2 is in service <u>If VAS-VNT loop is open, then</u> - Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ❯ $1.14 * (5L91\ SEL + 5L98\ VAS - Y)$, or
	    ❯ $3.03 * (2L112\ NLY + 0.2 * 5L98\ VAS - 400)$, or
	    ❯ $4.20 * (2L293\ SEL + 0.18 * 5L98\ VAS - 400)$, and do not shed WAN for this requirement.
	 $Y = 2060$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	 $Y = 1880$ if none of ACK 5CX1 & 5CX2 is in service

5L96 & 5L98	- Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed. - Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ❯ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or
	    ❯ $2.75 * (2L112\ NLY + 0.27 * (5L96\ SEL + Z) - 400)$, or
	    ❯ $2.75 * (2L112\ NLY + BDY\ Gen + 0.27 * (5L96\ SEL + Z) - 1220)$, or
	    ❯ $2.67 * (2L293\ SEL + 0.21 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement.
	 $Y = 2110$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	 $Y = 1870$ if none of ACK 5CX1 & 5CX2 is in service
	 $Z = 48L\ KET$ if DTT 48L is armed, or
	 $Z = 0$ if DTT 48L is not armed

5L92	- If (BC to US + 5L92 SEL) > 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: 5L92 SEL MW - If 700 MW < (BC to US + 5L92 SEL) <= 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: 5L92 SEL − 400 MW - If generation shedding is armed, keep a minimum of 2 REV, 2 SEV and 1 equivalent SEV units on-line post shedding. AND - Arm DTT 2L112 RAS if ❯ $2L112\ BDY + 0.3 * 5L92\ CBK > 400\ MW$, or
	    ❯ $2L293\ NLY + 0.3 * 5L92\ CBK > 400\ MW$, or
	    ❯ $2L112\ NLY + 0.3 * 5L92\ SEL - 0.3 *$ (armed KCL/SEV/ALH/WAN/BRX/REV/WAX shedding amount for 5L92 contingency) $> 400\ MW$, or
	    ❯ $2L293\ SEL + 0.3 * 5L92\ SEL - 0.3 *$ (armed KCL/SEV/ALH/WAN/BRX/REV/WAX shedding amount for 5L92 contingency) $> 400\ MW$

CONTINGENCY	SHEDDING REQUIREMENTS

5L94	(Note: Arming requirements for DTT 1L274 and DTT 1L275 are included in SOO 7T-17.)
	
	• If (BC to US + BC to AB) > 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: (BC to AB) MW
	• If 700 MW < (BC to US + BC to AB) <= 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: (BC to AB) – 400 MW
	• If generation shedding is armed, keep a minimum of 2 REV, 2 SEV, 1 KCL and 1/3 equivalent SEV units on-line post shedding, or keep a minimum of 2 REV, 2 SEV and 1 equivalent SEV units on-line post-shedding if the whole KCL is shutdown in pre-contingency condition.
	AND
	• Arm DTT 2L112 RAS if
	   ➢ 2L112 BDY + 0.3 * (AB to BC) > 400 MW, or
	   ➢ 2L293 NLY + 0.3 * (AB to BC) > 400 MW, or
	   ➢ 2L112 NLY + 0.3 * (BC to AB) – 0.3 * (armed KCL/SEV/ALH/WAN/BRX/REV/WAX shedding amount for 5L94 contingency) > 400 MW, or
	   ➢ 2L293 SEL + 0.3 * (BC to AB) – 0.3 * (armed KCL/SEV/ALH/WAN/BRX/REV/WAX shedding amount for 5L94 contingency) > 400 MW

Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.29 – 2L277 O.O.S (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2

Generation Shedding Requirements
2L277 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table A
5L79	Same as Table A
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L76 and 5L79	Same as Table 1.27 – 2L293 O.O.S.
5L87	Same as system normal Table 1.1
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as system normal Table 1.1

5L91	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    ➢ $1.10 * (5L91 \text{ SEL} + 5L96 \text{ SEL} - 1680)$, or
	    ➢ $3.70 * (2L112 \text{ NLY} + 0.18 * 5L91 \text{ SEL} - 400)$, or
	    ➢ $3.50 * (2L293 \text{ SEL} + 0.17 * 5L91 \text{ SEL} - 400)$.

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    ➢ $1.25 * (5L91 \text{ SEL} + 5L96 \text{ SEL} + Z - Y)$, or
	    ➢ $2.54 * (2L112 \text{ NLY} + 0.23 * (5L96 \text{ SEL} + Z) - 400)$, or
	    ➢ $2.54 * (2L112 \text{ NLY} + \text{BDY Gen} + 0.23 * (5L96 \text{ SEL} + Z) - 1120)$, or
	    ➢ $2.57 * (2L293 \text{ SEL} + 0.21 * (5L96 \text{ SEL} + Z) - 400)$.
	Y = 2040 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1820 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L is armed, or
	Z = 0 if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    ➢ $1.17 * (5L91 \text{ SEL} + 5L98 \text{ VAS} - Y)$, or
	    ➢ $2.94 * (2L112 \text{ NLY} + 0.17 * 5L98 \text{ VAS} - 400)$, or
	    ➢ $3.06 * (2L293 \text{ SEL} + 0.16 * 5L98 \text{ VAS} - 400)$.
	Y = 1810 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1710 if none of ACK 5CX1 & 5CX2 is in service. Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    ➢ $1.15 * (5L91 \text{ SEL} + 5L98 \text{ VAS} - Y)$, or
	    ➢ $2.85 * (2L112 \text{ NLY} + 0.20 * 5L98 \text{ VAS} - 400)$, or
	    ➢ $2.98 * (2L293 \text{ SEL} + 0.18 * 5L98 \text{ VAS} - 400)$.
	Y = 1910 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1740 if none of ACK 5CX1 & 5CX2 is in service

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND VAS-VNT loop closed
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    ➢ $1.25 * (5L91 \text{ SEL} + 5L96 \text{ SEL} + Z - Y)$, or
	    ➢ $2.54 * (2L112 \text{ NLY} + 0.27 * (5L96 \text{ SEL} + Z) - 400)$, or
	    ➢ $2.54 * (2L112 \text{ NLY} + \text{BDY Gen} + 0.27 * (5L96 \text{ SEL} + Z) - 1140)$, or
	    ➢ $2.46 * (2L293 \text{ SEL} + 0.25 * (5L96 \text{ SEL} + Z) - 400)$.
	Y = 2010 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1800 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L is armed, or
	Z = 0 if DTT 48L is not armed

5L92	(Note: Arming requirements for DTT 5L94, DTT 1L274 and DTT 1L275 are included in SOO 7T-17.)
	Arm DTT 2L112 RAS if
	    ➢ (0 < AB to BC <= 100 MW) **AND** (2L293 NLY + 0.75 * 5L92 CBK > 400 MW), or
	    ➢ (AB to BC > 100 MW) **AND** (2L293 NLY + 5L92 CBK - 0.68 * (AB to BC) > 400 MW), or
	    ➢ (0 <= BC to AB <= 100 MW) **AND** (2L293 SEL + 0.95 * 5L92 SEL − 0.2 * (BC to AB) > 400 MW), or
	    ➢ (BC to AB > 100 MW) **AND** (2L293 SEL + 5L92 SEL - 0.7 * (BC to AB) - 0.3 * (armed KCL/SEV/ALH/WAN/BRX/REV/WAX shedding amount for 5L94 contingency) > 400 MW)

5L94	Same as Table A
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.30 – 5L40 or 5L41 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

    Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.

- 5L87 Contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 4750 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

    Generation Shedding Requirements
    5L40 or 5L41 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
    Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS

5L81	Shed at MCA/REV: GS + 2.68 * M
	
	Where GS and M are calculated as follows:
	   GS = Max (0, 2.09 * (5L44 MDN + 0.72 * 5L81 NIC - 5L44_Over_Rating))
	   Y = 2L112 NLY + 0.03* 5L81 NIC - 0.15 * GS
	   Z = -2L293 NLY + 0.03 * 5L81 NIC - 0.14 * GS
	   If Y > NLYPST_OL_PickupMW, M1 = 0.63* (Y – NLYPST_OL_ResetMW), Else M1 = 0
	   If Z > 2L293OLRAS_PickupMW, M2 = 0.76 * (Z – 2L293OLRAS_Reset MW), Else M2 = 0
	   M = Max (M1, M2)

5L82	No shedding required.

5L83	Shed at MCA/REV: GS + 4.40 * M
	
	Where GS and M are calculated as follows:
	   GS = Max (0, 3.43 * (5L82 NIC + 0.42 * 5L83 NIC - 5L82_Over_Rating))
	   Y = 2L112 NLY + 0.04 * 5L83 NIC – 0.17 * GS
	   Z = -2L293 NLY + 0.04 * 5L83 NIC – 0.16 * GS
	   If Y > NLYPST_OL_PickupMW, M1 = 0.30 * (Y – NLYPST_OL_ResetMW), Else M1 = 0
	   If Z > 2L293OLRAS_PickupMW, M2 = 0.36 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0
	   M = Max (M1, M2)

5L87	No shedding required.

5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81_ Over_Rating)
	GS2 = 11 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 27.5* (2L51COK + 0.1 * 5L44MDN - 2L51COK_ Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.06 * 5L44 MDN – 0.15* M
	Z = 2L293 SEL + 0.06 * 5L44 MDN – 0.14 * M
	
	If Y > NLYPST_OL_ PickupMW,
	   R1 = 0.46 * (Y - NLYPST_OL_ResetMW)
	   R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	   R5 = 0.04 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	   R2 = 0.55 * (Z - 2L293OLRAS_ResetMW)
	   R4 = 0.13 * (Z - 2L293OLRAS_ResetMW)
	   R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	   ➢ D1 * (GS1 + 3.5* Ra)
	   ➢ D2 * (GS2 + 11* Rb)
	   ➢ D3 * (GS3 + 27.5* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.2 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 0.9 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.0 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L81 and 5L82	G1 = 5.2 * [5L42 KLY+ 0.29 * (5L81 + 5L82) NIC - 5L42_Over_Rating]
	G2 = 2.41 * [5L44 MDN+ 0.28 * (5L81 + 5L82) NIC - 5L44 Over Rating]
	G3 = 2.92 * [5L83 NIC + 0.54 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G4 = 3.88 * [5L87 NIC+ 0.35 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	G5 = 5.97 * [2L112 NLY+ 0.09 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G6 = 6.4 * [2L293 SEL+ 0.07 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5, G6)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.38 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G4 > 0.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500], then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.38 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G4 > 0.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 5.23 * [5L42 KLY + 0.29 * (5L81 + 5L83) NIC - 5L42_Over_Rating]
	G2 = 2.43 * [5L44 MDN + 0.24 * (5L81 + 5L83) NIC - 5L44_Over_Rating]
	G3 = 3.28 * [5L82 NIC + 0.49 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G4 = 3.81 * [5L87 NIC + 0.35 * (5L81 + 5L83) NIC - 5L87 Over_Rating]
	G5 = 5.94 * [2L112 NLY + 0.08 *(5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G6 = 6.39 * [2L293 SEL + 0.07 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5, G6)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.39 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G4 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.39 * (GS – the armed gen-shedding amount at MCA/REV). If G4 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1= 4.8 * [5L42 KLY + 0.36 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G2= 3.2 * [5L81 NIC + 0.51 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 3.7 * [5L87 NIC + 0.40 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 6.6 * [2L112 NLY + 0.07 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 7.1 * [2L293 SEL + 0.06 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.41 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.41 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

Table 1.31 - 5L42 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- 5L87 contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 5250 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
  5L42 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
  Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Shed at MCA/REV: GS + 2.63 * M Where GS and M are calculated as follows: 　GS = Max (0, 2.95 * (5L44 MDN + 0.57 * 5L81 NIC - 5L44_Over_Rating)) 　Y = 2L112 NLY + 0.05 * 5L81 NIC - 0.15 * GS 　Z = -2L293 NLY + 0.04 * 5L81 NIC - 0.14 * GS 　If Y > NLYPST_OL_PickupMW, M1 = 0.46 * (Y – NLYPST_OL_ResetMW), Else M1 = 0 　If Z > 2L293OLRAS_PickupMW, M2 = 0.55 * (Z – 2L293OLRAS_Reset MW), Else M2 = 0 　M = Max (M1, M2)
5L82	No shedding required.
5L83	No shedding required.
5L87	No shedding required.
5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81_ Over_Rating) 　GS2 = 14.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating) 　GS3 = 37.5* (2L51COK + 0.1 * 5L44MDN - 2L51COK_ Over_Rating) 　M = MAX (GS1, GS2, GS3, 0) 　Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.13* M 　Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.11* M 　If Y > NLYPST_OL_PickupMW, 　　R1 = 0.38 * (Y - NLYPST_OL_ResetMW) 　　R3 = 0.07 * (Y - NLYPST_OL_ResetMW) 　　R5 = 0.04 * (Y - NLYPST_OL_ResetMW) 　Else R1 = 0, R3 = 0, R5 = 0. 　If Z > 2L293OLRAS_PickupMW, 　　R2 = 0.45 * (Z - 2L293OLRAS_ResetMW) 　　R4 = 0.1 * (Z - 2L293OLRAS_ResetMW) 　　R6 = 0.05 * (Z - 2L293OLRAS_ResetMW) 　Else R2 = 0, R4 = 0, R6 = 0. 　Ra = MAX (R1, R2) 　Rb = MAX (R3, R4) 　Rc = MAX (R5, R6) - Shed at MCA/REV first, and then GMS/PCN the greatest of: 　➢ D1 * (GS1 + 3.5* Ra) 　➢ D2 * (GS2 + 14.5* Rb) 　➢ D3 * (GS3 + 37.5* Rc) Where: D1 = 1.0 if shedding at MCA/REV, or D1 = 1.7 if shedding at GMS/PCN, D2 = 1.0 if shedding at MCA/REV, or D2 = 1.45 if shedding at GMS/PCN, D3 = 1.0 if shedding at MCA/REV, or D3 = 2.2 if shedding at GMS/PCN, Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions: - Reduce the flow on 2L129 from ARN to VIT. - Reduce SI generation and increase Peace generation.

5L81 and 5L82	G1 = 3.28 * [5L87 NIC+ 0.35 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	　G2 = 3.16 * [5L83 NIC+ 0.55 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	　G3 = 4.81 * [5L41 KLY+ 0.30 * (5L81 + 5L82) NIC - 5L41_Over_Rating]
	　G4 = 10.53 * [2L112 NLY+ 0.06 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	　G5 = 10.53 * [2L293 SEL+ 0.05 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	　GS = Max (G1,G2,G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	- Arm DTT 5L94, and
	- Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	- Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	- Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.53 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G1 > 0.
	- Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	- Shed at MCA/REV first: GS
	- Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.53 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G1 > 0.
	- Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 4.9 * [5L41 KLY + 0.30 * (5L81 + 5L83) NIC - 5L41_Over_Rating]
	G2 = 3.0 * [5L82 NIC + 0.58 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G3 = 3.8 * [5L87 NIC + 0.34 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 6.9 * [2L112 NLY + 0.06 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 7.3 * [2L293 SEL + 0.06 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.38 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.38 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.

5L82 and 5L83	G1 = 5.3 * [5L41 KLY + 0.31 * (5L82 + 5L83) NIC - 5L41_Over_Rating]
	G2 = 3.0 * [5L81 NIC + 0.55 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 3.9 * [5L87 NIC + 0.36 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 6.8 * [2L112 NLY + 0.07 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 7.3 * [2L293 SEL + 0.06 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.37 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.37 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.

Table 1.32 - 5L44 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- 5L87 contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 5300 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.
- Limit: 5L81 NIC MW <= 5L81_Norm_Rating
  If TSA-PM alarms "VIOLATION_5L81_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to reduce the flow on 5L81 from NIC within its continuous rating:
  - Reduce 2L129 flow, or
  - Increase LM/VI/Peace generation and reduce SI generation, or
  - Reduce AB to BC transfer, or
  - Reduce BC export to US.

- 2L50 contingency:

  ► Limit:
  - 2L51 COK + 0.4 * 2L50 BSY <= 2L51COK_Over_Rating
  If TSA-PM alarms "VIOLATION_2L51 COK OVER RATING_2L50CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 ARN, or
  - Increase generation at SEE, RUS and SFL, or
  - Reduce generation at BR and North Shore Area, or
  - Reduce export to US on 5L51 and 5L52.

- 2L11 contingency:

  ► Limit: 2L51 COK + 0.45 * 2L11 BSY <= 2L51COK_Over_Rating
  If TSA-PM alarms "VIOLATION_2L51 COK OVER RATING_2L11CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 ARN, or
  - Increase generation at SEE, RUS and SFL, or
  - Reduce generation at BR and North Shore Area, or
  - Reduce export to US on 5L51 and 5L52.

- 2L49 contingency:

  ► Limit: 2L51 COK + 0.50 * 2L49 MDN <= 2L51COK_Over_Rating
  If TSA-PM alarms "VIOLATION_2L51 COK OVER RATING_2L49CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 ARN, or
  - Increase generation at SEE, RUS and SFL, or
  - Reduce generation at BR and North Shore Area, or
  - Reduce export to US on 5L51 and 5L52.

- 2L51 contingency:

  ► Limit: 2L50 BSY + 0.25 * 2L51 COK <= 2L50_Over_Rating
  If TSA-PM alarms "VIOLATION_2L50 OVER RATING_2L51CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 ARN, or
  - Increase generation at SEE, RUS and SFL, or
  - Reduce generation at BR and North Shore Area, or
  - Reduce export to US on 5L51 and 5L52.

Generation Shedding Requirements
5L44 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS

5L81	GS1 = 3.5 * (5L41 KLY + 0.44 * 5L81 NIC – 5L41_Over_Rating)
	GS2 = 11* (2L20 CSQ + 0.19 * 5L81 NIC - 2L20_Over_Rating)
	GS3 = 28 * (2L51 COK + 0.1 * 5L81 NIC - 2L51COK_Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.12 * 5L81 NIC – 0.16* M
	Z = 2L293 SEL + 0.11 * 5L81 NIC – 0.14 * M
	
	If Y > NLYPST_OL_PickupMW,
	  R1 = 0.38 * (Y - NLYPST_OL_ResetMW)
	  R3 = 0.12 * (Y - NLYPST_OL_ResetMW)
	  R5 = 0.06 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0,
	
	If Z > 2L293OLRAS_PickupMW,
	  R2 = 0.44 * (Z - 2L293OLRAS_ResetMW)
	  R4 = 0.15 * (Z - 2L293OLRAS_ResetMW)
	  R6 = 0.07 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0,
	
	  Ra = MAX (R1, R2)
	  Rb = MAX (R3, R4)
	  Rc = MAX (R5, R6)
	
	● Shed at MCA/REV the greatest of:
	  GS1 + 3.5* Ra
	  GS2 + 11* Rb
	  GS3 + 28* Rc
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the operator can take the following actions:
	▲ Reduce the flow on 2L129 from ART to VIT.
	▲ Reduce SI generation and increase Peace generation.

5L82	No shedding required.
5L83	No shedding required.

5L81 and 5L82	G1 = 4.13 * [5L41 KLY + 0.29 * (5L81 + 5L82) NIC - 5L41_Over_Rating]
	G2 = 2.75 * [5L87 NIC + 0.47 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	G3 = 5.52 * [2L112 NLY+ 0.09 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G4 = 5.94 * [2L293 SEL+ 0.08 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	 • Arm DTT 5L94, and
	 • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	 • Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	 • Then at SEV/ALH/WAN/BRX/WAX/KCL: 1.32 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G2 > 0, do not select GMS/PCN for shedding
	 • Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
	 • Shed at MCA/REV first: GS
	 • Then at SEV/ALH/WAN/BRX/WAX/KCL: 1.32 * (GS – the armed gen-shedding amount at MCA/REV). If G2 > 0, do not select GMS/PCN for shedding
	 • Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 4.16 * [5L41 KLY + 0.29 * (5L81 + 5L83) NIC - 5L41_Over_Rating]
	G2 = 5.38 * [5L82 NIC + 0.37 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G3 = 2.74 * [5L87 NIC + 0.47 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 5.54 * [2L112 NLY + 0.09 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 5.96 * [2L293 SEL + 0.08 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	 • Arm DTT 5L94, and
	 • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	 • Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	 • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.28 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	 • Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	 • Shed at MCA/REV first: GS
	 • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.28 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	 • Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 3.0 * [5L81 NIC + 0.35 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G2 = 3.4 * [5L87 NIC + 0.59 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G3 = 8.3 * [2L112 NLY + 0.04 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G4 = 8.9 * [2L293 SEL + 0.03 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	 • Arm DTT 5L94, and
	 • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	 • Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	 • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.28 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G2 > 0, do not select GMS and PCN for shedding.
	 • Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
	 • Shed at MCA/REV first: GS
	 • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.28 * (GS – the armed gen-shedding amount at MCA/REV). If G2 > 0, do not select GMS and PCN for shedding.
	 • Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L87	No shedding required.

Table 1.33 - 5L45 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- 5L87 Contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 4350 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
  5L45 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
  Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Shed at MCA/REV: GS + 2.41 * R Where GS and M are calculated as follows: $\quad$ GS = Max (0, 2.88 * (5L44 MDN + 0.58 * 5L81 NIC - 5L44_Over_Rating)) $\quad$ Y = 2L112 NLY + 0.05 * 5L81 NIC - 0.15 * GS $\quad$ Z = -2L293 NLY + 0.04 * 5L81 NIC - 0.14 * GS $\quad$ If Y > NLYPST_OL_PickupMW, R1 = 0.48 * (Y – NLYPST_OL_ResetMW), Else R1 = 0 $\quad$ If Z > 2L293OLRAS_PickupMW, R2 = 0.58 * (Z – 2L293OLRAS_Reset MW), Else R2 = 0 $\quad$ R = Max (R1, R2)
5L82	No shedding required.
5L83	No shedding required.
5L87	No shedding required.
5L44	$\quad$ GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81_ Over_Rating) $\quad$ GS2 = 14.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating) $\quad$ GS3 = 33 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_ Over_Rating) $\quad$ M = MAX (GS1, GS2, GS3, 0) $\quad$ Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.13* M $\quad$ Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.11 * M $\quad$ If Y > NLYPST_OL_PickupMW, $\qquad$ R1 = 0.38 * (Y - NLYPST_OL_ResetMW) $\qquad$ R3 = 0.08 * (Y - NLYPST_OL_ResetMW) $\qquad$ R5 = 0.04 * (Y - NLYPST_OL_ResetMW) $\quad$ Else R1 = 0, R3 = 0, R5 = 0. $\quad$ If Z > 2L293OLRAS_PickupMW, $\qquad$ R2 = 0.45 * (Z - 2L293OLRAS_ResetMW) $\qquad$ R4 = 0.1 * (Z - 2L293OLRAS_ResetMW) $\qquad$ R6 = 0.05 * (Z - 2L293OLRAS_ResetMW) $\quad$ Else R2 = 0, R4 = 0, R6 = 0. $\quad$ Ra = MAX (R1, R2) $\quad$ Rb = MAX (R3, R4) $\quad$ Rc = MAX (R5, R6) - Shed at MCA/REV first, and then GMS/PCN the greatest of: $\quad\triangleright$ D1 * (GS1 + 3.5* Ra) $\quad\triangleright$ D2 * (GS2 + 14.5* Rb) $\quad\triangleright$ D3 * (GS3 + 33* Rc) Where: D1 = 1.0 if shedding at MCA/REV, or D1 = 1.7 if shedding at GMS/PCN, D2 = 1.0 if shedding at MCA/REV, or D2 = 1.5 if shedding at GMS/PCN, D3 = 1.0 if shedding at MCA/REV, or D3 = 2.5 if shedding at GMS/PCN. Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions: - Reduce the flow on 2L129 from ARN to VIT. - Reduce SI generation and increase Peace generation.

5L81 and 5L82	G1 = 7.07 * [5L41 KLY + 0.22 * (5L81 + 5L82) NIC - 5L41_Over_Rating]
	G2 = 3.38 * [5L83 NIC + 0.51 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G3 = 3.61 * [5L87 NIC + 0.36 * (5L81 + 5L82) NIC -5L87_Over_Rating]
	G4 = 6.09 * [2L112 NLY + 0.09 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G5 = 6.4 * [2L293 SEL + 0.07 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	- Arm DTT 5L94, and
	- Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	- Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	- Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.33 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G3 > 0.
	- Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	- Shed at MCA/REV first: GS
	- Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.33 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G3 > 0.
	- Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 6.85 * [5L41 KLY + 0.23 * (5L81 + 5L83) NIC - 5L41_Over_Rating]
	G2 = 3.74 * [5L82 NIC + 0.46 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G3 = 3.55 * [5L87 NIC + 0.37 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 6.09 * [2L112 NLY + 0.09 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 6.39 * [2L293 SEL + 0.07 * (5L81+5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.34 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.34 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 6.2 * [5L41 KLY + 0.27 * (5L82 + 5L83) NIC - 5L41_Over_Rating]
	G2 = 3.8 * [5L81 NIC + 0.51 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 3.4 * [5L87 NIC + 0.40 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 6.5 * [2L112 NLY + 0.07 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 7.0 * [2L293 SEL + 0.06 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.49 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding. If G3 > 0, do not select GMS and PCN for shedding.
	
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.49 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

Table 1.34 - GUI 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
GUI 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Gen shed at MCA/REV: GS + 3.26 * R Where GS and R are calculated as follows: GS = Max (0, 2.45 * (5L44 MDN + 0.68 * 5L81 NIC - 5L44_Over_Rating)) Y = 2L112 NLY + 0.05 * 5L81 NIC - 0.15 * GS Z = -2L293 NLY + 0.05 * 5L81 NIC - 0.14 * GS If Y > NLYPST_OL_PickupMW, R1 = 0.52 * (Y - NLYPST_OL_ResetMW), Else R1 = 0 If Z > 2L293OLRAS_PickupMW, R2 = 0.63 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0 R = Max (R1, R2)
5L82	No shedding required.
5L83	No shedding required.
5L87	No shedding required.

5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81_Over_Rating)
	GS2 = 13.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 33 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.12* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.11 * M
	
	If Y > NLYPST_OL_PickupMW,
	    R1 = 0.4 * (Y - NLYPST_OL_ResetMW)
	    R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	    R5 = 0.04 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0
	
	If Z > 2L293OLRAS_PickupMW,
	    R2 = 0.46 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	    R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	- Shed at MCA/REV first, and then GMS/PCN the greatest of:
	    ➢ D1 * (GS1 + 3.5 * Ra)
	    ➢ D2 * (GS2 + 13.5 * Rb)
	    ➢ D3 * (GS3 + 33 * Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 2 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.25 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.6 if shedding at GMS/PCN,
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	- Reduce the flow on 2L129 from ARN to VIT.
	- Reduce SI generation and increase Peace generation

5L81 and 5L82	GS1 = 3.01 * [5L83 NIC + 0.54*(5L81 + 5L82) NIC - 5L83_Over_Rating]
	GS2 = 3.45 * [5L44 NIC + 0.13*(5L81 + 5L82) NIC - 5L44_Over_Rating]
	GS3 = 8.02 * [2L112 NLY+ 0.06 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	GS4 = 8.44 * [2L293 SEL+ 0.05 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	- Arm DTT 5L94, and
	- Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	- Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	- Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.51 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]
	- Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	- Shed at MCA/REV first: GS
	- Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.51 * (GS – the armed gen-shedding amount at MCA/REV)
	- Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 10.6 * [5L42 KLY + 0.16 * (5L81 + 5L83) NIC - 5L42_Over_Rating] G2 = 2.9 * [5L82 NIC + 0.55 * (5L81 + 5L83) NIC - 5L82_Over_Rating] G3 = 6.4 * [2L112 NLY + 0.07 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW] G4 = 6.9 * [2L293 SEL + 0.06 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]

	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.36 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >=500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.36 * (GS – the armed gen-shedding amount at MCA/REV)
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 8.6 * [5L42 KLY + 0.23 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G2 = 3.0 * [5L81 NIC + 0.52 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 6.6 * [2L112 NLY + 0.07 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G4 = 7.0 * [2L293 SEL + 0.06 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.35 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.35 * (GS – the armed gen-shedding amount at MCA/REV)
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

Table 1.35 - AMC 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- 5L87 contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 5100 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.
- Limit: 5L44 MDN MW <= 5L44_Norm_Rating
  If TSA alarms "VIOLATION_5L44_NORM_RATING", then the BC Hydro Control Centre staff shall take the following actions to reduce the flow on 5L44 from MDN within its continuous rating:
  - Reduce SI generation, or
  - Reduce LM to VI transfer on 2L129, or
  - Reduce ING to CUS transfer

Generation Shedding Requirements
AMC 5CX1 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Gen shed at MCA/REV: GS + 2.98 * R Where GS and R are calculated as follows: GS = Max (0, 2.54 * (5L44 MDN + 0.61 * 5L81 NIC - 5L44_Over_Rating)) Y = 2L112 NLY + 0.04 * 5L81 NIC - 0.15 * GS Z = -2L293 NLY + 0.06 * 5L81 NIC - 0.14 * GS If Y > NLYPST_OL_PickupMW, R1 = 0.51 * (Y - NLYPST_OL_ResetMW), Else R1 = 0 If Z > 2L293OLRAS_PickupMW, R2 = 0.53 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0 R = Max (R1, R2)
5L82	No shedding required.
5L83	No shedding required.

5L81 and 5L82	G1 = 3.46 * [5L83 NIC + 0.48 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G2 = 3.26 * [5L87 NIC + 0.42 * (5L81 + 5L82) NIC -5L87_Over_Rating]
	G3 = 6.3 * [2L112 NLY+ 0.07 * (5L81 + 5L82) NIC -NLYPST_OL_PickupMW]
	G4 = 6.79 * [2L293 SEL+ 0.06* (5L81 + 5L82) NIC -2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	  • Arm DTT 5L94, and
	  • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	  • Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.3 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G2 > 0.
	  • Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	  • Shed at MCA/REV first: GS
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.3 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G2 > 0.
	  • Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 3.76 * [5L82 NIC + 0.45 * (5L81+ 5L83) NIC - 5L82_Over_Rating]
	G2 = 3.21 * [5L87 NIC + 0.43 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G3 = 6.5 * [2L112 NLY + 0.07 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G4 = 6.76 * [2L293 SEL + 0.06 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	  • Arm DTT 5L94, and
	  • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	  • Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.35 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G2 > 0, do not select GMS and PCN for shedding.
	  • Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	  • Shed at MCA/REV first: GS
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.35 * (GS – the armed gen-shedding amount at MCA/REV). If G2 > 0, do not select GMS and PCN for shedding.
	  • Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 5.7 * [5L42 KLY + 0.32 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G2 = 2.5 * [5L87 NIC + 0.58 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G3 = 6.7 * [2L112 NLY + 0.07 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G4 = 7.1 * [2L293 SEL + 0.06 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	  • Arm DTT 5L94, and
	  • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	  • Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.32 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G2 > 0, do not select GMS and PCN for shedding.

	• Total armed generation shedding must be limited to (2500 - AB to BC) MW If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then • Shed at MCA/REV first: GS • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.32 * (GS – the armed gen-shedding amount at MCA/REV). If G2 > 0, do not select GMS and PCN for shedding. • Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.
5L87	Shed at REV/MCA: 2.7 * (0.14 * 5L87 NIC + 5L44 MDN + 50 – 5L44_Over_Rating)

5L44	$GS1 = 5 * (5L41KLY + 0.3 * 5L44MDN – 5L41\_Over\_Rating)$
	$GS2 = 12.5 * (2L20CSQ + 0.2 * 5L44\ MDN - 2L20\_Over\_Rating)$
	$GS3 = 30 * (2L51COK + 0.1 * 5L44MDN - 2L51COK\_Over\_\ Rating)$
	
	$M = MAX (GS1, GS2, GS3, 0)$
	$Y = 2L112\ NLY + 0.06 * 5L44\ MDN – 0.12* M$
	$Z = 2L293\ SEL + 0.05 * 5L44\ MDN – 0.10 * M$
	
	If Y > NLYPST_OL_PickupMW,
	   $R1 = 0.28 * (Y - NLYPST\_OL\_ResetMW)$
	   $R3 = 0.1 * (Y - NLYPST\_OL\_ResetMW)$
	   $R5 = 0.04 * (Y - NLYPST\_OL\_ResetMW)$
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	   $R2 = 0.33 * (Z - 2L293OLRAS\_ResetMW)$
	   $R4 = 0.13 * (Z - 2L293OLRAS\_ResetMW)$
	   $R6 = 0.05 * (Z - 2L293OLRAS\_ResetMW)$
	Else R2 = 0, R4 = 0, R6 = 0.
	
	$Ra = MAX (R1, R2)$
	$Rb = MAX (R3, R4)$
	$Rc = MAX (R5, R6)$
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➢ $D1 * (GS1 + 5 * Ra)$
	  ➢ $D2 * (GS2 + 12.5 * Rb)$
	  ➢ $D3 * (GS3 + 30 * Rc)$
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 0.7 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.2 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.5 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

Table 1.36 – AMC 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- 5L87 contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 5100 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
AMC 5CX2 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Gen shed at MCA/REV: GS + 2.84 * R Where GS and R are calculated as follows: GS = Max (0, 2.77 * (5L44 MDN + 0.59 * 5L81 NIC - 5L44_Over_Rating)) Y = 2L112 NLY + 0.05 * 5L81 NIC - 0.16 * GS Z = -2L293 NLY + 0.04 * 5L81 NIC - 0.15 * GS If Y > NLYPST_OL_PickupMW, R1 = 0.49 * (Y - NLYPST_OL_ResetMW), Else R1 = 0 If Z > 2L293OLRAS_PickupMW, R2 = 0.59 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0 R = Max (R1, R2)
5L82	No shedding required
5L83	No shedding required

5L81 and 5L82	G1 = 3.24 * [5L44 MDN + 0.25 * (5L81 + 5L82) NIC - 5L44_Over_Rating]
	G2 = 3.51 * [5L83 NIC + 0.47 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G3 = 3.26 * [5L87 NIC + 0.43 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	G4 = 6.3 * [2L112 NLY + 0.08 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G5 = 6.57 * [2L293 SEL + 0.06* (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	  • Arm DTT 5L94, and
	  • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	  • Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.38 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS/ PCN for shedding.
	  • Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	  • Shed at MCA/REV first: GS
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.38 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding.
	  • Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 7.86 * [5L41 KLY + 0.22 * (5L81 + 5L83) NIC - 5L41_Over_Rating]
	G2 = 6.4 * [5L42 KLY + 0.25 * (5L81 + 5L83) NIC - 5L42_Over_Rating]
	G3 = 2.56 * [5L87 NIC + 0.56 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 5.37 * [2L112 NLY + 0.1 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 5.49 * [2L293 SEL + 0.1 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	  • Arm DTT 5L94, and
	  • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	  • Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.29 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS/PCN for shedding.
	  • Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	  • Shed at MCA/REV first: GS
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.29 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding.
	  • Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 7.1 * [5L42 KLY + 0.27 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G2 = 3.9 * [5L81 NIC + 0.44 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 3.1 * [5L87 NIC + 0.47 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 6.9 * [2L112 NLY + 0.06 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 7.4 * [2L293 SEL + 0.05 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	  • Arm DTT 5L94, and
	  • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	  • Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	  • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.47 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS/PCN for shedding.
	  • Total armed generation shedding must be limited to (2500 - AB to BC) MW

	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then • Shed at MCA/REV first: GS • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.47 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS/PCN for shedding. • Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.
5L87	No shedding required.

5L44	$GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN - 5L81\_Over\_Rating)$
	$GS2 = 13.5 * (2L20CSQ + 0.2 * 5L44\ MDN - 2L20\_Over\_Rating)$
	$GS3 = 35 * (2L51COK + 0.1 * 5L44MDN - 2L51COK\_Over\_Rating)$
	
	$M = MAX\ (GS1, GS2, GS3, 0)$
	$Y = 2L112\ NLY + 0.05 * 5L44\ MDN - 0.12 * M$
	$Z = 2L293\ SEL + 0.05 * 5L44\ MDN - 0.10 * M$
	
	If Y > NLYPST_OL_PickupMW,
	   $R1 = 0.38 * (Y - NLYPST\_OL\_ResetMW)$
	   $R3 = 0.1 * (Y - NLYPST\_OL\_ResetMW)$
	   $R5 = 0.04 * (Y - NLYPST\_OL\_ResetMW)$
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	   $R2 = 0.45 * (Z - 2L293OLRAS\_ResetMW)$
	   $R4 = 0.1 * (Z - 2L293OLRAS\_ResetMW)$
	   $R6 = 0.05 * (Z - 2L293OLRAS\_ResetMW)$
	Else R2 = 0, R4 = 0, R6 = 0.
	
	$Ra = MAX\ (R1, R2)$
	$Rb = MAX\ (R3, R4)$
	$Rc = MAX\ (R5, R6)$
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➢ $D1 * (GS1 + 3.5 * Ra)$
	  ➢ $D2 * (GS2 + 13.5 * Rb)$
	  ➢ $D3 * (GS3 + 35 * Rc)$
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.65 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.15 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.35 if shedding at GMS/PCN
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

Table 1.37 – CHP 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- 5L87 contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 5250 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
CHP 5CX1 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Gen shed at MCA/REV: GS + 2.56 * R Where GS and R are calculated as follows: GS = Max (0, 2.31 * (5L44 MDN + 0.66 * 5L81 NIC - 5L44_Over_Rating)) Y = 2L112 NLY + 0.04 * 5L81 NIC - 0.15 * GS Z = -2L293 NLY + 0.04 * 5L81 NIC - 0.14 * GS If Y > NLYPST_OL_PickupMW, R1 = 0.55 * (Y - NLYPST_OL_ResetMW), Else R1 = 0 If Z > 2L293OLRAS_PickupMW, R2 = 0.67 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0 R = Max (R1, R2)
5L82	No shedding required.
5L83	No shedding required.
5L87	No shedding required.

5L44	GS1 = 3.5 * (5L81NIC + 0.38 * 5L44MDN – 5L81_Over_Rating)
	 GS2 = 13.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20_Over_Rating)
	 GS3 = 37.5 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	 M = MAX (GS1, GS2, GS3, 0)
	 Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.12* M
	 Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.10 * M
	
	 If Y > NLYPST_OL_PickupMW,
	     R1 = 0.40 * (Y - NLYPST_OL_ResetMW)
	     R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	     R5 = 0.04 * (Y - NLYPST_OL_ResetMW)
	 Else R1 = 0, R3 = 0, R5 = 0.
	
	 If Z > 2L293OLRAS_PickupMW,
	     R2 = 0.5 * (Z - 2L293OLRAS_ResetMW)
	     R4 = 0.12 * (Z - 2L293OLRAS_ResetMW)
	     R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	 Else R2 = 0, R4 = 0, R6 = 0.
	
	 Ra = MAX (R1, R2)
	 Rb = MAX (R3, R4)
	 Rc = MAX (R5, R6)
	
	 • Shed at MCA/REV first, and then GMS/PCN the greatest of:
	   ➤ D1 * (GS1 + 3.5* Ra)
	   ➤ D2 * (GS2 + 13.5* Rb)
	   ➤ D3 * (GS3 + 37.5* Rc)
	 Where:
	 D1 = 1.0 if shedding at MCA/REV, or
	 D1 = 1.45 if shedding at GMS/PCN,
	 D2 = 1.0 if shedding at MCA/REV, or
	 D2 = 1.05 if shedding at GMS/PCN,
	 D3 = 1.0 if shedding at MCA/REV, or
	 D3 = 1.25 if shedding at GMS/PCN.
	
	 Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	 • Reduce the flow on 2L129 from ARN to VIT.
	 • Reduce SI generation and increase Peace generation

5L81 and 5L82	G1 = 6.66 * [5L42 KLY+ 0.24 * (5L81 + 5L82) NIC - 5L42_Over_Rating]
	 G2 = 2.81 * [5L44 MDN + 0.19 * (5L81 + 5L82) NIC - 5L44_Over_Rating]
	 G3 = 3.22 * [5L83 NIC + 0.5 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	 G4 = 3.51 * [5L87 NIC + 0.39 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	 G5 = 6.24 * [2L112 NLY + 0.08 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	 G6 = 6.67 * [2L293 SEL + 0.07 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	 GS = Max (0, G1, G2, G3, G4, G5, G6)
	
	 If AB to BC >= 500 MW AND GS >= 1500 MW, then
	 • Arm DTT 5L94, and
	 • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	 • Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	 • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.35 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G4 > 0.
	 • Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	 If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	 • Shed at MCA/REV first: GS
	 • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.35 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G4 > 0.
	 • Total armed generation shedding must be limited to 2500 MW.
	
	 If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

| 5L81 and 5L83 | G1 = 6.64 * [5L42 KLY + 0.24 * (5L81 + 5L83) NIC - 5L42_Over_Rating]
G2 = 2.84 * [5L44 MDN + 0.18 * (5L81 + 5L83) NIC - 5L44_Over_Rating]
G3 = 3.6 * [5L82 NIC + 0.47 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
G4 = 3.46 * [5L87 NIC + 0.4 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
G5 = 6.26 * [2L112 NLY + 0.08 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
G6 = 6.69 * [2L293 SEL + 0.07 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]

GS = Max (0, G1, G2, G3, G4, G5, G6)

If AB to BC >= 500 MW AND GS >= 1500 MW, then
• Arm DTT 5L94, and
• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.41 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G4 > 0, do not select GMS and PCN for shedding.
• Total armed generation shedding must be limited to (2500 - AB to BC) MW

If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
• Shed at MCA/REV first: GS
• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.41 * (GS – the armed gen-shedding amount at MCA/REV). If G4 > 0, do not select GMS and PCN for shedding.
• Total armed generation shedding must be limited to 2500 MW.

If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied. |
| 5L82 and 5L83 | G1 = 6.0 * [5L42 KLY + 0.30 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
G2 = 4.0 * [5L81 NIC + 0.46 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
G3 = 3.4 * [5L87 NIC + 0.45 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
G4 = 6.5 * [2L112 NLY + 0.06 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
G5 = 7.0 * [2L293 SEL + 0.06 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]

GS = Max (0, G1, G2, G3, G4, G5)

If AB to BC >= 500 MW AND GS >= 1500 MW, then
• Arm DTT 5L94, and
• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.52 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
• Total armed generation shedding must be limited to (2500 - AB to BC) MW

If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
• Shed at MCA/REV first: GS
• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.52 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
• Total armed generation shedding must be limited to 2500 MW.

If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied. |

Table 1.38 – CRK 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- 5L87 contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 5250 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
CRK 5CX1 Series capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Gen shed at MCA/REV: GS + 2.75 * R Where GS and R are calculated as follows: GS = Max (0, 2.64 * (5L44 MDN + 0.60 * 5L81 NIC - 5L44_Over_Rating)) Y = 2L112 NLY + 0.04 * 5L81 NIC - 0.15 * GS Z = -2L293 NLY + 0.04 * 5L81 NIC - 0.14 * GS If Y > NLYPST_OL_PickupMW, R1 = 0.50 * (Y - NLYPST_OL_ResetMW), Else R1 = 0 If Z > 2L293OLRAS_PickupMW, R2 = 0.60 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0 R = Max (R1, R2)
5L82	No shedding required.
5L83	No shedding required.

5L81 and 5L82	G1 = 7.62 * [5L41 KLY + 0.2 * (5L81 + 5L82) NIC - 5L41_Over_Rating]
	G2 = 3.51 * [5L44 MDN + 0.09 * (5L81 + 5L82) NIC - 5L44_Over_Rating]
	G3 = 3.35 * [5L83 NIC + 0.5 * (5L81 + 5L82) NIC - 5L83_Over_Rating]
	G4 = 3.45 * [5L87 NIC + 0.4 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	G5 = 6.02 * [2L112 NLY + 0.08 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G6 = 6.35 * [2L293 SEL + 0.07 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1,G2,G3, G4, G5, G6)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.37 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G4 > 0.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.37 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G4 > 0.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 7.43 * [5L41 KLY + 0.2 * (5L81 + 5L83) NIC - 5L41_Over_Rating]
	G2 = 3.78 * [5L82 NIC + 0.46 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G3 = 3.4 * [5L87 NIC + 0.4 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 6.04 * [2L112 NLY + 0.08 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 6.35 * [2L293 SEL + 0.07 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.37 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.37 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 7.2 * [5L41 KLY + 0.21 * (5L82 + 5L83) NIC - 5L41_Over_Rating] G2 = 3.9 * [5L81 NIC + 0.47 * (5L82 + 5L83) NIC - 5L81_Over_Rating] G3 = 3.3 * [5L87 NIC + 0.44 * (5L82 + 5L83) NIC - 5L87_Over_Rating] G4 = 6.7 * [2L112 NLY + 0.06 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW] G5 = 7.1 * [2L293 SEL + 0.06 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW] GS = Max (0, G1, G2, G3, G4, G5) If AB to BC >= 500 MW AND GS >= 1500 MW, then • Arm DTT 5L94, and • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and • Shed at MCA/REV first: 0.93 * (GS – AB to BC) • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.34 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding. • Total armed generation shedding must be limited to (2500 - AB to BC) MW

	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then • Shed at MCA/REV first: GS • Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.34 * (GS – the armed gen-shedding amount at MCA/REV). If G3 > 0, do not select GMS and PCN for shedding. • Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.
5L87	No shedding required.

5L44	$GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81\_ Over\_Rating)$
	$GS2 = 13.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20\_Over\_Rating)$
	$GS3 = 33.5* (2L51COK + 0.1 * 5L44MDN - 2L51COK\_ Over\_Rating)$
	
	$M = MAX (GS1, GS2, GS3, 0)$
	$Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.12* M$
	$Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.10 * M$
	
	If $Y >$ NLYPST_OL_PickupMW,
	    $R1 = 0.38 * (Y -$ NLYPST_OL_ResetMW$)$
	    $R3 = 0.1 * (Y -$ NLYPST_OL_ResetMW$)$
	    $R5 = 0.04 * (Y -$ NLYPST_OL_ResetMW$)$
	Else $R1 = 0, R3 = 0, R5 = 0$.
	
	If $Z > 2L293OLRAS\_PickupMW$,
	    $R2 = 0.46 * (Z - 2L293OLRAS\_ResetMW)$
	    $R4 = 0.1 * (Z - 2L293OLRAS\_ResetMW)$
	    $R6 = 0.05 * (Z - 2L293OLRAS\_ResetMW)$
	Else $R2 = 0, R4 = 0, R6 = 0$.
	
	$Ra = MAX (R1, R2)$
	$Rb = MAX (R3, R4)$
	$Rc = MAX (R5, R6)$
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➢ $D1 * (GS1 + 3.5* Ra)$
	  ➢ $D2 * (GS2 + 13.5* Rb)$
	  ➢ $D3 * (GS3 + 33.5* Rc)$
	Where:
	$D1 = 1.0$ if shedding at MCA/REV, or
	$D1 = 1.65$ if shedding at GMS/PCN,
	$D2 = 1.0$ if shedding at MCA/REV, or
	$D2 = 1.25$ if shedding at GMS/PCN,
	$D3 = 1.0$ if shedding at MCA/REV, or
	$D3 = 1.60$ if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

Table 1.39 - RYC 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- 5L87 contingency:
  Limit (5L81 + 5L82 + 5L83 + 5L87) NIC < 5100 MW when BCH load >= 8500 MW.
  If TSAPM alarms "Voltage instability for a loss of 5L87", the BC Hydro Control Centre staff shall increase NI generation.

Generation Shedding Requirements
RYC 5CX1 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Gen shed at MCA/REV: GS + 3.18 * R Where GS and R are calculated as follows: GS = Max (0, 2.81 * (5L44 MDN + 0.58 * 5L81 NIC - 5L44_Over_Rating)) Y = 2L112 NLY + 0.05 * 5L81 NIC - 0.16 * GS Z = -2L293 NLY + 0.04 * 5L81 NIC - 0.14 * GS If Y > NLYPST_OL_PickupMW, R1 = 0.48 * (Y - NLYPST_OL_ResetMW), Else R1 = 0 If Z > 2L293OLRAS_PickupMW, R2 = 0.58 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0 R = Max (R1, R2)
5L82	No shedding required
5L83	Same as system normal Table 1.1

5L81 and 5L82	G1 = 7.85 * [5L41KLY + 0.22 * (5L81 + 5L82) NIC - 5L41_Over_Rating]
	G2 = 6.4 * [5L42 KLY + 0.27 * (5L81 + 5L82) NIC - 5L42_Over_Rating]
	G3 = 2.53 * [5L87 NIC + 0.56 * (5L81 + 5L82) NIC - 5L87_Over_Rating]
	G4 = 5.7 * [2L112 NLY + 0.1 * (5L81 + 5L82) NIC - NLYPST_OL_PickupMW]
	G5 = 5.52 * [2L293 SEL + 0.09 * (5L81 + 5L82) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.30 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. Do not select GMS/PCN for shedding if G3 > 0.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.30 * (GS – the armed gen-shedding amount at MCA/REV). Do not select GMS/PCN for shedding if G3 > 0.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L81 and 5L83	G1 = 3.82 * [5L82 NIC + 0.43 * (5L81 + 5L83) NIC - 5L82_Over_Rating]
	G2 = 3.21 * [5L87 NIC + 0.44 * (5L81 + 5L83) NIC - 5L87_Over_Rating]
	G3 = 6.74 * [2L112 NLY + 0.07 * (5L81 + 5L83) NIC - NLYPST_OL_PickupMW]
	G4 = 6.7 * [2L293 SEL + 0.06 * (5L81 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.34 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G2 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.34 * (GS – the armed gen-shedding amount at MCA/REV). If G2 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to 2500 MW.
	
	If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.

5L82 and 5L83	G1 = 7.1 * [5L42 KLY + 0.27 * (5L82 + 5L83) NIC - 5L42_Over_Rating]
	G2 = 3.9 * [5L81 NIC + 0.44 * (5L82 + 5L83) NIC - 5L81_Over_Rating]
	G3 = 3.1 * [5L87 NIC + 0.47 * (5L82 + 5L83) NIC - 5L87_Over_Rating]
	G4 = 6.9 * [2L112 NLY + 0.06 * (5L82 + 5L83) NIC - NLYPST_OL_PickupMW]
	G5 = 7.4 * [2L293 SEL + 0.05 * (5L82 + 5L83) NIC - 2L293OLRAS_PickupMW]
	
	GS = Max (0, G1, G2, G3, G4, G5)
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV first: 0.93 * (GS – AB to BC)
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.46 * [0.93 * (GS – AB to BC) – the armed gen-shedding amount at MCA/REV]. If G3 > 0, do not select GMS and PCN for shedding.
	• Total armed generation shedding must be limited to (2500 - AB to BC) MW
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	• Shed at MCA/REV first: GS
	• Then at SEV/ALH/WAN/BRX/WAX/KCL/GMS/PCN: 1.46 * (GS – the armed gen-shedding amount at MCA/REV). If

	G3 > 0, do not select GMS and PCN for shedding. • Total armed generation shedding must be limited to 2500 MW. If generation shedding is armed, the minimum units on line requirements post-shedding at MCA, REV, SEV, KCL, WAN, ALH, BRX, WAX and the equivalent SEV units specified in Note 14 in Section 3 shall be applied.
5L87	No shedding required.
5L44	Same as AMC 5CX2 O.O.S. – Table 1.36.

Table 1.40 – VAS T1 or T2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
Notes 2 and 3 in Section 2.

Generation Shedding Requirements
(VAS T1 or T2) O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Tables A, B, C and D are applicable to this contingency
5L79	Tables A, B, C and D are applicable to this contingency
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L87	Same as system normal Table 1.1
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as system normal Table 1.1
5L91	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: • 1.20 * (5L91 SEL + 5L96 SEL − 1700), • 3.4 * (2L112 NLY + 0.21 * 5L91 SEL − 400), or • 3.8 * (2L293 SEL + 0.17 * 5L91 SEL − 400), and do not shed WAN for this requirement.

5L96	• Arm DTT 48L if VAS-WTS loop is closed AND 5L96 SEL > 600 MW
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z − Y), or
	  ➢ 2.37 * (2L112 NLY + 0.24 * (5L96 SEL + Z) − 400), or
	  ➢ 2.37 * (2L112 NLY + BDY Gen + 0.24 * (5L96 SEL + Z) − 1120), or
	  ➢ 3.05 * (2L293 SEL + 0.17 * (5L96 SEL + Z) − 400), and do not shed WAN for this requirement.
	Y = 2050 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1820 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L is armed, or
	Z = 0 if DTT 48L is not armed

5L98	• Arm DTT 73L if VAS-VNT loop is closed and 5L98 VAS > 620 MW
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25 * (5L91 SEL + 5L98 VAS + Z − Y), or
	  ➢ 2.75 * (2L112 NLY + 0.22 * (5L98 VAS + Z) − 400), or
	  ➢ 2.75 * (2L112 NLY + BDY Gen + 0.22 * (5L98 VAS + Z) − 1180), or
	  ➢ 3.18 * (2L293 SEL + 0.17 * (5L98 VAS + Z) − 400), and do not shed WAN for this requirement.
	Y = 2120 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1950 if none of ACK 5CX1 & 5CX2 is in service
	Z = 73L RGA if DTT 73L is armed, or
	Z = 0 if DTT 73L is not armed

5L96 and 5L98	Tables A, B, C and D are applicable to this contingency
5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No gen shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No gen shedding required.

Table 1.41 – VAS T1 AND T2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Note 2 in Section 2.
- 5L91 and 5L96 contingency:
  - Limit: 5L91 SEL + 5L96 SEL + Y + Z < 2500 MW
    Y = 2L112 NLY if 2L112 NLY > 0, or Y = 0 if 2L112 NLY <= 0
    Z = 48L KET if both VAS-WTS and VAS-VNT loops are closed, or Z = 0 if VAS-WTS loop or/and VAS-VNT loop is/are open
  - If SEL 5RX3 is available, then limit:
    (FBC injection into SEL area) + W < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 − 1 SEV @ MIN.MW
    Otherwise, limit:
    (FBC injection into SEL area) + W < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 − 1 SEV @ MIN.MW − 1 KCL @MIN.MW
    Where FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL − 2L286 SEL MW
    FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
    W = AB to BC MW if AB to BC > 0, or
    W = 0 if AB to BC <= 0
  - Alarm if 5L91 SEL + 5L96 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
    If 5L91 SEL + 5L96 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    Z = 48L KET if both VAS-WTS and VAS-VNT loops are closed, or Z = 0 if VAS-WTS loop or/and VAS-VNT loop is/are open
    If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91 and 5L96.

Generation Shedding Requirements
(VAS T1 AND T2) O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table A
5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service in Table A
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX1	No shedding required.
Bypass AMC 5CX2	No shedding required.
Bypass RYC 5CX1	No shedding required.
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L76 and 5L79	Same as Table D
5L87	Same as system normal Table 1.1
5L91 and 5L96	- Arm DTT 2L112 RAS - Arm DTT 48L RAS if both VAS-WTS and VAS-VNT loops are closed - Shed at KCL/ALH/SEV/WAN/BRX/WAX: 5L91 SEL + 5L96 SEL + 2L112 NLY + Y + Z + V − 850 MW Y = 0 if AB to BC >= 0 MW, or Y = (BC to AB transfer) if BC to AB > 0 MW Z = 48L KET if DTT 48L RAS is armed, or Z = 0 if DTT 48L RAS is not armed. V = 0 MW if MATL120S_PST230 <= 0 MW, or V = MATL120S_PST230 if MATL120S_PST230 > 0 MW If generation shedding is armed, keep a minimum of 1 SEV unit on-line post-shedding if SEL 5RX3 is available, or keep a minimum of 1 SEV and 1 KCL units on-line post-shedding if SEL 5RX3 is unavailable, or keep a minimum of 1 SEV and 2/3 equiv. SEV units on-line post-shedding if SEL 5RX3 is unavailable and the whole KCL plant is shutdown in pre-contingency condition. Note: If gen-shedding is armed at KCL, the gen-shedding at KCL shall not cause the 230 kV main buses 2MB4 & 2MB2 to be disconnected from 2MB3 & 2MB1 after shedding.
5L44	Same as system normal Table 1.1
5L91	- Arm DTT 48L if both VAS-WTS and VAS-VNT loops are closed AND if (5L91 SEL + 5L96 SEL + 48L KET) > 1650 MW - Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: 1.16 * (5L91 SEL+5L96 SEL + Z − 1750), or 3.30 * (2L112 NLY + 0.21 * (5L91 SEL + Z) − 400), or 3.50 * (2L293 SEL + 0.18 * (5L91 SEL + Z) − 400), and do not shed WAN for this requirement. Z = 48L KET if DTT 48L RAS is armed, or Z = 0 if DTT 48L RAS is not armed.
5L96	- Arm DTT 48L if both VAS-WTS and VAS-VNT loops are closed AND if (5L91 SEL + 5L96 SEL + 48L KET) > 1700 MW - Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: 1.25 * (5L91 SEL + 5L96 SEL + Z − Y), or 2.63 * (2L112 NLY + 0.23 * (5L96 SEL + Z) − 400), or 2.63 * (2L112 NLY + BDY Gen + 0.23 * (5L96 SEL + Z) − 1150), or 3.10 * (2L293 SEL + 0.19 * (5L96 SEL + Z) − 400), and do not shed WAN for this requirement. Y = 2080 if at least one of ACK 5CX1 & 5CX2 is in service, or Y = 1800 if none of ACK 5CX1 & 5CX2 is in service Z = 48L KET if DTT 48L RAS is armed, or Z = 0 if DTT 48L RAS is not armed.
5L98	Same as 5L96 contingency in this table except that the value of 1700 MW included in the 1st bullet is changed to 1500 MW
5L96 & 5L98	- Arm DTT 48L if both VAS-WTS and VAS-VNT loops are closed AND if (5L91 SEL + 5L96 SEL + 48L KET) > 1650 MW - Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: 1.25*(5L91 SEL + 5L96 SEL + Z − Y), or 2.96 * (2L112 NLY + 0.26 * (5L96 SEL + Z) − 400), or 2.96 * (2L112 NLY + BDY Gen + 0.26 * (5L96 SEL + Z) − 1160), or 3.00 * (2L293 SEL + 0.20 * (5L96 SEL + Z) − 400), and do not shed WAN for this requirement. Y = 2010 if at least one of ACK 5CX1 & 5CX2 is in service, or Y = 1740 if none of ACK 5CX1 & 5CX2 is in service Z = 48L KET if DTT 48L RAS is armed, or Z = 0 if DTT 48L RAS is not armed.
5L92	Same as system normal Table A
5L94	Same as system normal Table A
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.42 – FBC's 75L or 76L O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
    Notes 2 and 3 in Section 2.

Generation Shedding Requirements
    FBC's (75L or 76L) O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
    Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Tables A, B, C and D are applicable to this contingency
5L79	Tables A, B, C and D are applicable to this contingency
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
Bypass AMC 5CX2	No shedding required
Bypass AMC 5CX1	No shedding required
Bypass RYC 5CX1	No shedding required
5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1
5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L87	Same as system normal Table 1.1
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as system normal Table 1.1
5L91	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: • $1.17 * (5L91\ SEL + 5L96\ SEL - Y)$, • $3.56 * (2L112\ NLY + 0.18 * 5L91\ SEL - 400)$, or • $4.10 * (2L293\ SEL + 0.18 * 5L91\ SEL - 400)$, and do not shed WAN for this requirement. $Y = 1715$ if SEL T1 & (T2 or/and T3) & T4 are in service, or $Y = 1675$ if SEL T1 or (T2 & T3) or T4 is O.O.S.
5L96	Tables A, B, C and D are applicable to this contingency
5L98	Table A, B, C and D are applicable to this contingency

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW and both VAS-WTS and VAS-VNT loops are closed
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or
	  ➢ $2.50 * (2L112\ NLY + 0.24 * (5L96\ SEL + Z) - 400)$, or
	  ➢ $2.50 * (2L112\ NLY + BDY\ Gen + 0.24 * (5L96\ SEL + Z) - 1100)$, or
	  ➢ $2.93 * (2L293\ SEL + 0.20 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement.
	$Y = 2050$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	$Y = 1870$ if none of ACK 5CX1 & 5CX2 is in service
	$Z = 48L$ KET if DTT 48L is armed, or
	$Z = 0$ if DTT 48L is not armed.

5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 1.43 – 2L20 or 2L44 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

      Pre-Outage Restrictions:
        ➤ Notes 2 and 3 in Section 2.

      Generation Shedding Requirements
        2L20 or 2L44 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L87	Same as system normal Table 1.1

5L44	$GS1 = 3.5 * (5L81NIC + 0.38 * 5L44MDN - 5L81\_Over\_Rating)$
	$GS2 = 10.5 * (2L22MDN + 0.25 * 5L44\ MDN - 2L22\_Over\_Rating)$
	
	$M = MAX\ (GS1, GS2, 0)$
	$Y = 2L112\ NLY + 0.05 * 5L44\ MDN - 0.12 * M$
	$Z = 2L293\ SEL + 0.05 * 5L44\ MDN - 0.10 * M$
	
	If $Y >$ NLYPST_OL_PickupMW,
	    $R1 = 0.38 * (Y -$ NLYPST_OL_ResetMW$)$
	    $R3 = 0.12 * (Y -$ NLYPST_OL_ResetMW$)$
	Else $R1 = 0, R3 = 0$.
	
	If $Z > 2L293OLRAS\_PickupMW$,
	    $R2 = 0.46 * (Z - 2L293OLRAS\_ResetMW)$
	    $R4 = 0.15 * (Z - 2L293OLRAS\_ResetMW)$
	Else $R2 = 0, R4 = 0$.
	
	$Ra = MAX\ (R1, R2)$
	$Rb = MAX\ (R3, R4)$
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➤ $D1 * (GS1 + 3.5 * Ra)$
	  ➤ $D2 * (GS2 + 10.5 * Rb)$
	Where:
	$D1 = 1.0$ if shedding at MCA/REV, or
	$D1 = 1.65$ if shedding at GMS/PCN,
	$D2 = 1.0$ if shedding at MCA/REV, or
	$D2 = 1.25$ if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1

Table 1.44 – 2L22 or 2L27 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

    Pre-Outage Restrictions:
> Notes 2 and 3 in Section 2.

    Generation Shedding Requirements
      2L22 or 2L27 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

      Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L87	Same as system normal Table 1.1

5L44	$GS1 = 3.5 * (5L81NIC + 0.38 * 5L44MDN - 5L81\_Over\_Rating)$
	$GS2 = 10.5 * (2L20CSQ + 0.28 * 5L44\ MDN - 2L20\_Over\_Rating)$
	
	$M = MAX (GS1, GS2, 0)$
	$Y = 2L112\ NLY + 0.05 * 5L44\ MDN - 0.13 * M$
	$Z = 2L293\ SEL + 0.05 * 5L44\ MDN - 0.12 * M$
	
	If $Y >$ NLYPST_OL_PickupMW,
	    $R1 = 0.38 * (Y -$ NLYPST_OL_ResetMW$)$
	    $R3 = 0.12 * (Y -$ NLYPST_OL_ResetMW$)$
	Else $R1 = 0$, $R3 = 0$.
	
	If $Z > 2L293OLRAS\_PickupMW$,
	    $R2 = 0.46 * (Z - 2L293OLRAS\_ResetMW)$
	    $R4 = 0.15 * (Z - 2L293OLRAS\_ResetMW)$
	Else $R2 = 0$, $R4 = 0$.
	
	$Ra = MAX (R1, R2)$
	$Rb = MAX (R3, R4)$
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	    ➢ $D1 * (GS1 + 3.5 * Ra)$
	    ➢ $D2 * (GS2 + 10.5 * Rb)$
	Where:
	$D1 = 1.0$ if shedding at MCA/REV, or
	$D1 = 1.65$ if shedding at GMS/PCN,
	$D2 = 1.0$ if shedding at MCA/REV, or
	$D2 = 1.25$ if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1

Table 1.45 – 2L64 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- 5L44 Contingency:
  Limit: 2L56 CAM TAP + 0.12 * 5L44 ING + E <= 2L56_OverRating

  Where E is calculated as follows:
  Y = 2L112 BDY + 0.041 * 5L44 ING
  Z = 2L293 NLY + 0.033 * 5L44 ING
  If Y > NLYPST_OL_PickupMW,
      E1 = 0.068 * (Y - NLYPST_OL_ResetMW)
  Otherwise,
      E1 = 0
  If Z > 2L293OLRAS_PickupMW,
      E2 = 0.083 * (Z - 2L293OLRAS_ResetMW)
  Otherwise,
      E2 = 0
  E= Max (E1, E2)

  If TSA-PM alarms "VIOLATION_2L56 (CAM TAP-MAN) OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52

- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
2L64 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L83	Same as system normal Table 1.1
5L87	Same as system normal Table 1.1

5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81_ Over_Rating)
	GS2 = 13.5 * (2L20CSQ + 0.2 * 5L44 MDN - 2L20 Over Rating)
	GS3 = 21.5 * (2L45SPG + 0.1 * 5L44MDN - 2L45 Over Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.12* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.10 * M
	
	If Y > NLYPST_OL_PickupMW,
	    R1 = 0.38 * (Y - NLYPST_OL_ResetMW)
	    R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	    R5 = 0.06 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	    R2 = 0.46 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	    R6 = 0.06 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➢ D1 * (GS1 + 3.5* Ra)
	  ➢ D2 * (GS2 + 13.5* Rb)
	  ➢ D3 * (GS3 + 21.5* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.65 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.25 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L81 and 5L82	Same as system normal Table 1.1
5L81 and 5L83	Same as system normal Table 1.1
5L82 and 5L83	Same as system normal Table 1.1

Table 2.2 – 5L83 AND 5L71 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

    Pre-Outage Restrictions:
- Limit: 5L72 MCA <= 5L72_Norm_Rating MW
- Notes: 2 and 3 in Section 2.

    Generation Shedding Requirements
       5L83 AND 5L71 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

    Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L72 (3P) (TSA-PM must treat it as "5L71 (3P) AND 5L72 (3P)" contingency to obtain required RAS functions)	Same as 5L71 (3P) and 5L72 (3P) contingency in Table E
5L72 (1P)	Same as 5L71 O.O.S. Table 1.2
Bypass SYA 5CX2	Same as 5L71 O.O.S. Table 1.2
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16 with the following exception: If generation shedding is armed, AND - If on-line MCA units >= 2 and if SEL 5RX3 is available, keep a minimum of 2 MCA, 2 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding, or - If on-line MCA units >= 2 and if SEL 5RX3 is unavailable, keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding, or - If on-line MCA unit = 1 and if SEL 5RX3 is available, keep a minimum of 1 MCA, 2 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding, or - If on-line MCA unit = 1 and if SEL 5RX3 is unavailable, keep a minimum of 1 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding
5L87	Shed at MCA/REV: 1.1 * ((5L81 + 5L82 + 5L87) NIC - 4100) MW
5L44	Same as 5L83 O.O.S. Table 1.16

Table 2.3 – 5L83 AND 5L72 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit: 5L71 MCA <= 5L71_Norm_Rating MW
- Notes: 2 and 3 in Section 2.

Generation Shedding Requirements
5L83 AND 5L72 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P) (TSA-PM must treat it as "5L71 (3P) AND 5L72 (3P)" contingency to obtain required RAS functions)	Same as 5L71 (3P) and 5L72 (3P) contingency in Table E
5L71 (1P)	Same as 5L72 (1P) contingency in 5L71 O.O.S. Table 1.2
Bypass SYA 5CX1	Same as Bypass SYA 5CX2 in 5L71 O.O.S. Table 1.2
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16, with additional requirement of selecting MCA units for shedding first and keeping a minimum of 2 MCA units on-line post-shedding.
5L81 and 5L82	Same as 5L83 AND 5L71 O.O.S. Table 2.2.
5L87	Same as 5L83 AND 5L71 O.O.S. Table 2.2
5L44	Same as 5L83 O.O.S. Table 1.16

Table 2.4 – 5L83 AND SYA 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2.

Generation Shedding Requirements
5L83 AND SYA 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P)	Same as SYA 5CX1 O.O.S. Table 1.4
5L72 (3P)	Same as SYA 5CX1 O.O.S. Table 1.4
5L71 (1P)	Same as SYA 5CX1 O.O.S. Table 1.4
5L72 (1P)	Same as SYA 5CX1 O.O.S. Table 1.4
Bypass SYA 5CX2	Same as SYA 5CX1 O.O.S. Table 1.4
5L71 (3P) and 5L72 (1P)	Same as SYA 5CX1 O.O.S. Table 1.4
5L71 (1P) and 5L72 (3P)	Same as SYA 5CX1 O.O.S. Table 1.4
5L71 (1P) and 5L72 (1P)	Same as SYA 5CX1 O.O.S. Table 1.4
5L71 (3P) and 5L72 (3P)	Same as Table E
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L87	Same as 5L83 O.O.S. Table 1.16
5L44	Same as 5L83 O.O.S. Table 1.16

Table 2.5 – 5L83 AND SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2.

Generation Shedding Requirements
5L83 AND SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P)	Same as SYA 5CX2 O.O.S Table 1.5
5L72 (3P)	Same as SYA 5CX2 O.O.S Table 1.5
5L71 (1P)	Same as SYA 5CX2 O.O.S Table 1.5
5L72 (1P)	Same as SYA 5CX2 O.O.S Table 1.5
Bypass SYA 5CX1	Same as SYA 5CX2 O.O.S Table 1.5
5L71 (3P) and 5L72 (1P)	Same as SYA 5CX2 O.O.S Table 1.5
5L71 (1P) and 5L72 (3P)	Same as SYA 5CX2 O.O.S Table 1.5
5L71 (1P) and 5L72 (1P)	Same as SYA 5CX2 O.O.S Table 1.5
5L71 (3P) and 5L72 (3P)	Same as Table E
5L81	Same as system normal Table 1.1
5L82	Same as system normal Table 1.1
5L81 and 5L82	Same as system normal Table 1.1
5L87	Same as system normal Table 1.1
5L44	Same as system normal Table 1.1

Table 2.6 – 5L83 AND SYA 5CX1 AND SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

    Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2.

    Generation Shedding Requirements
    5L83 AND SYA 5CX1 AND SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

    Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P)	Same as SYA 5CX2 O.O.S Table 1.5
5L72 (3P)	Same as SYA 5CX1 O.O.S Table 1.4
5L71 (1P)	Same as SYA 5CX1 AND SYA 5CX2 O.O.S. Table 1.6
5L72 (1P)	Same as SYA 5CX1 AND SYA 5CX2 O.O.S. Table 1.6
5L71 (3P) and 5L72 (1P)	Same as SYA 5CX1 AND SYA 5CX2 O.O.S. Table 1.6
5L71 (1P) and 5L72 (3P)	Same as SYA 5CX1 AND SYA 5CX2 O.O.S. Table 1.6
5L71 (1P) and 5L72 (1P)	Same as SYA 5CX1 AND SYA 5CX2 O.O.S. Table 1.6
5L71 (3P) and 5L72 (3P)	Same as Table E
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L87	Same as 5L83 O.O.S. Table 1.16
5L44	Same as 5L83 O.O.S. Table 1.16

Table 2.7 – 5L83 AND 5L71 AND SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2.

MCA MW output limit

MCA Output Limit vs 5L76+5L79+5L98 Flow into NIC (5L71&SYA 5CX2 OOS, or 5L72&SYA 5CX1 OOS)
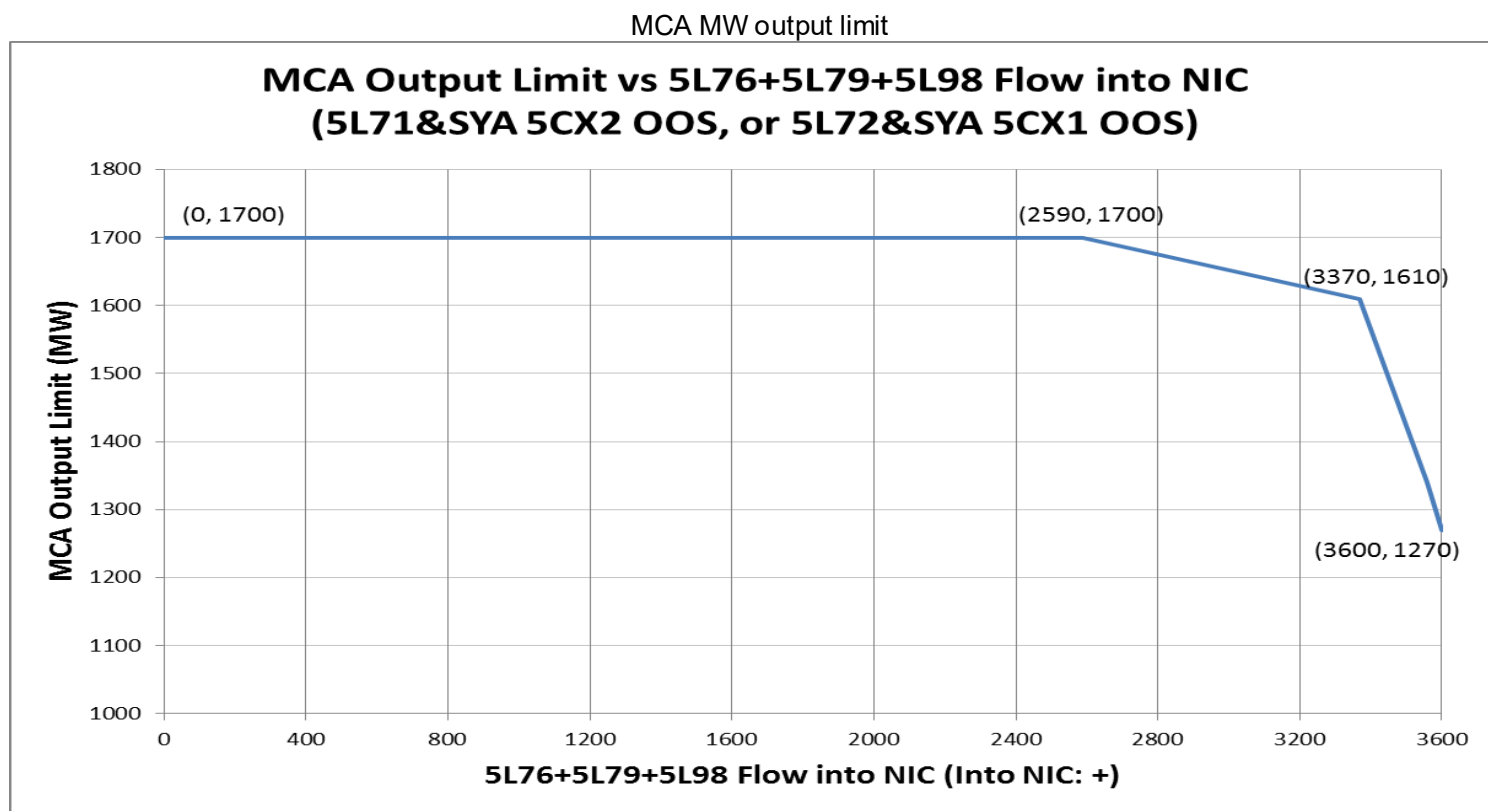
Interpretation of the above MCA MW limit diagram.

The segment from point (0, 1700) to point (2590, 1700) is a voltage stability limit for a 5L82 contingency.
The segment from point (2590, 1700) to point (3370, 1610) is a voltage stability limit for a 5L87 contingency.
The segment from point (3370, 1610) to point (3600, 1270) is limited by the maximum generation shedding capability of 2500MW for 5L81 & 5L82 contingency.

Generation Shedding Requirements
5L83 AND 5L71 AND SYA 5CX2 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L72 (3P) (TSA-PM must treat it as "5L71 (3P) AND 5L72 (3P)" contingency to obtain required RAS functions)	Same as 5L71 (3P) and 5L72 (3P) contingency in Table E
5L72 (1P)	Same as 5L71 AND SYA 5CX2 O.O.S. Table 1.7
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
5L81 and 5L82	Same as 5L83 AND 5L71 O.O.S. Table 2.2
5L87	Same as 5L83 AND 5L71 O.O.S. Table 2.2
5L44	Same as 5L83 O.O.S. Table 1.16

Table 2.8 – 5L83 AND 5L72 AND SYA 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2.
- MCA MW output limit:
- same as the nomogram in Table 2.7.

Generation Shedding Requirements
5L83 AND 5L72 AND SYA 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P) (TSA-PM must treat it as "5L71 (3P) AND 5L72 (3P)" contingency to obtain required RAS functions)	Same as 5L71 (3P) and 5L72 (3P) contingency in Table E.
5L71 (1P)	Same as 5L72 (1P) contingency in Table 1.7 – 5L71 AND SYA 5CX2 O.O.S.
5L81	Same as 5L83 O.O.S Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16, with additional requirement of selecting MCA units for shedding first and keeping a minimum 2 MCA units on-line post-shedding.
5L81 and 5L82	Same as 5L83 AND 5L71 O.O.S. Table 2.2
5L87	Same as 5L83 AND 5L71 O.O.S. Table 2.2
5L44	Same as 5L83 O.O.S. Table 1.16

Table 2.9 – 5L83 AND 5L71 AND 5L72 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:

- Notes 2 and 3 in Section 2.
- This table is applicable to BCH load <= 8500 MW. Both 5L71 and 5L72 O.O.S. should be avoided when BCH load > 8500 MW. If the outage cannot be avoided, special studies are required.
- For restrictions of NIC 500 kV reactors, refer to Section 8.3.9 in 7T-18.

Generation Shedding Requirements:
5L83 AND 5L71 and 5L72 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table F is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table A
5L79	Same as Table A
5L81	Shed at REV: the shedding requirement is the same as 5L83 O.O.S. Table 1.16
5L82	Shed at REV: the shedding requirement is the same as 5L83 O.O.S. Table 1.16
Bypass AMC 5CX2, or Bypass AMC 5CX1	No shedding required

5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable.
	
	If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	　If BC is exporting to US, then reduce BC to US export.
	　If BC is importing from US, then
	　　• reduce (SI and FBC) generation and increase Peace generation, or/and
	　　• reduce (SI and FBC) generation and increase import from US
	
	If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then GS is the greater of:
	　• 1.13 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA + 2L112 NLY – 2250], or
	　• 1.15 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY + 2L112 NLY – 3800]
	
	If 2L112 NLY >= 200 AND 0.10 * (5L81 + 5L82) NIC + 2L293 SEL <= 420, then GS is the greater of:
	　• 1.18 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA – 2250], or
	　• 1.20 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY – 3800]
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	　• Arm DTT 5L94, and
	　• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	　• If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then
	　　　Shed at REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.05 * AB to BC
	　　Otherwise
	　　　Shed at REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.10 * AB to BC
	　• Total armed generation shedding must be limited to 2500 - AB to BC
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500] , then
	　• Shed at REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: GS
	　• Total armed generation shedding must be limited to 2500 MW
	
	Arm DTT 2L112 RAS, If
	　• 2L112 NLY < 200 AND GS > 0 , or
	　• 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420

CONTINGENCY	SHEDDING REQUIREMENTS
5L76 and 5L79	Same as 5L71 AND 5L72 O.O.S. Table 1.9
5L87	No generation shedding
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as 5L83 O.O.S. Table 1.16 except for no shedding at MCA.
5L91	Tables A, B, C and D are applicable to this contingency
5L96	Tables A, B, C and D are applicable to this contingency
5L98	Both VAS-WTS and VAS-VNT loops closed, or VAS-WTS loop open and VAS-VNT loop closed • Same as Table A Both VAS-WTS and VAS-VNT loops open, or VAS-VNT loop open and VAS-WTS loop closed • Same as Table C
5L96 & 5L98	Both VAS-WTS and VAS-VNT loops closed • Same as Tables A VAS-WTS loop open, or VAS-VNT loop open, or both VAS-WTS and VAS-VNT loops open • Same as Table C
5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No generation shedding
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No generation shedding

Table 2.10 – 5L83 AND 5L75 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit: 5L77 REV <= 5L77_Norm_Rating MW
- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
Note: Tables A, B, C, D and E are applicable to this Table, except for single contingencies 5L76, 5L79 as indicated in this table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L77 (3P) (TSA-PM must treat it as "5L75 (3P) and 5L77 (3P)" contingency to obtain required RAS functions)	Same as 5L75 (3P) and 5L77 (3P) contingency in Table F.
5L77 (1P)	Shed at REV: REV Gen - 2000 MW
5L76	Shed at REV: 1.03 * (5L77 REV + (5L91 + 5L96) SEL – 4000) MW if REV Gen <= 2000 MW
5L79	Same gen shedding as 5L76 contingency.
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L87	Same as 5L83 O.O.S. Table 1.16
5L44	Same as 5L83 O.O.S. Table 1.16

Table 2.11 – 5L83 AND 5L77 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions
- Limit: 5L75 REV <= 5L75_Norm_Rating MW
- Notes: 2 and 3 in Section 2.

Generation Shedding Requirements
Note: Tables A, B, C, D and E are applicable to this Table, except for single contingencies 5L76, 5L79 as indicated in this table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P) (TSA-PM must treat it as "5L75 (3P) and 5L77 (3P)" contingency to obtain required RAS functions)	Same as 5L75 (3P) and 5L77 (3P) contingency in Table F.
5L75 (1P)	Shed at REV: REV Gen - 2000 MW
5L76	ACK 5CB8 in service: Shed at REV: 1.03 * (5L75 REV + (5L91 + 5L96) SEL – 4000) MW if REV Gen <= 2000 MW ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75) Shed REV down to 0 MW.
5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service.
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L87	Same as 5L83 O.O.S. Table 1.16
5L44	Same as 5L83 O.O.S. Table 1.16

Table 2.12 – 5L83 AND 5L76 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes: 2 and 3 in Section 2

Generation Shedding Requirements
5L83 AND 5L76 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as ACK 5CB5 in service in Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L79	Tables A, B, C and D for contingency 5L76 AND 5L79 are applicable to this contingency
5L87	Shed at MCA/REV: 1.14 * ((5L81 + 5L82 + 5L87) NIC - 4000) MW
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as 5L83 O.O.S. Table 1.16
5L91	Tables A, B, C and D are applicable to this contingency
5L96	- Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed - Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: $2.20 * (5L79\ ACK + 0.60 * (5L96\ SEL + Z) - 5L79\_Over\_Rating)$ $1.25 * (5L79\ ACK + 5L96\ SEL + Z - Y)$, or $2.45 * (2L112\ NLY + 0.25 * (5L96\ SEL + Z) - 400)$, or $2.45 * (2L112\ NLY + BDY\ Gen + 0.25 * (5L96\ SEL + Z) - 1170)$, or $3.10 * (2L293\ SEL + 0.19 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement Y = Min (3050, 1800 + 0.60 * REV MW) if at least one of ACK 5CX1 & 5CX2 is in service, or Y = Min (2790, 1500 + 0.60 * REV MW) if none of ACK 5CX1 & 5CX2 is in service Z = 48L KET if DTT 48L is armed, or Z = 0 if DTT 48L is not armed
5L98	If VAS-VNT loop is closed, then - Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: $1.94 * (5L79\ ACK + 0.77 * 5L98\ VAS - 5L79\_Over\_Rating)$ $1.73 * (5L79\ ACK + 5L98\ VAS - Y)$, or $2.71 * (2L112\ NLY + 0.21 * 5L98\ VAS - 400)$, or $2.71 * (2L112\ NLY + BDY\ Gen + 0.21 * 5L98\ VAS - 1200)$, or $3.75 * (2L293\ SEL + 0.17 * 5L98\ VAS - 400)$, and do not shed WAN for this requirement Y = (1700 + 0.56 * REV MW) if at least one of ACK 5CX1 & 5CX2 is in service, or Y = (1500 + 0.56 * REV MW) if none of ACK 5CX1 & 5CX2 is in service. Otherwise, Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: $1.94 * (5L79\ ACK + 0.77 * 5L98\ VAS - 5L79\_Over\_Rating)$ $1.70 * (5L79\ ACK + 5L98\ VAS - Y)$, or $2.60 * (2L112\ NLY + 0.25 * 5L98\ VAS - 400)$, or $2.60 * (2L112\ NLY + BDY\ Gen + 0.25 * 5L98\ VAS - 1200)$, or $3.60 * (2L293\ SEL + 0.20 * 5L98\ VAS - 400)$, and do not shed WAN for this requirement Y = Min (2950, 1560 + 0.60 * REV MW) if at least one of ACK 5CX1 & 5CX2 is in service, or Y = Min (2750, 1360 + 0.60 * REV MW) if none of ACK 5CX1 & 5CX2 is in service
5L96 & 5L98	- Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed. - Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: $2.20 * (5L79\ ACK + 0.64 * (5L96\ SEL + Z) - 5L79\_Over\_Rating)$ $1.25 * (5L79\ ACK + 5L96\ SEL + Z - Y)$, or $2.44 * (2L112\ NLY + 0.24 * (5L96\ SEL + Z) - 400)$, or $2.44 * (2L112\ NLY + BDY\ Gen + 0.24 * (5L96\ SEL + Z) - 1350)$, or $2.56 * (2L293\ SEL + 0.18 * 5L96\ SEL - 400)$, and do not shed WAN for this requirement Y = Min (2970, 1570 + 0.64 * REV MW) if at least one of ACK 5CX1 & 5CX2 is in service, or Y = Min (2770, 1370 + 0.64 * REV MW) if none of ACK 5CX1 & 5CX2 is in service Z = 48L KET if DTT 48L is armed, or Z = 0 if DTT 48L is not armed
5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.13 – 5L83 AND 5L79 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit: 5L76 ACK <= 5L76_Norm_Rating MW
- Notes 2 and 3 in Section 2

Generation Shedding Requirements
5L83 AND 5L79 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F. ACK 5CB5 O.O.S.: (5L75 contingency will trip open 5L76) No gen shedding. (note: The gen shedding for 5L76 contingency in this table has covered this contingency)
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S.: (5L75 (3P) & 5L77 (1P) contingency will trip open 5L76) • Shed REV down to 500 MW. AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding. If generation shedding is armed, keep a minimum of 1 REV unit on-line post-shedding, which should be the same REV unit as for 5L76 contingency in this table.
5L75 (3P) and 5L77 (3P)	Same as Table F
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L76	Tables A, B, C and D for contingency 5L76 AND 5L79 are applicable to this contingency.
5L87	Same as 5L83 AND 5L76 O.O.S. Table 2.12
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as 5L83 O.O.S. Table 1.16
5L91	Tables A, B, C and D are applicable to this contingency

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ $2.20 * (5L76 \text{ ACK} + 0.60 * (5L96 \text{ SEL} + Z) - 5L76\_Over\_Rating)$
	  ➢ $1.25 * (5L76 \text{ ACK} + 5L96 \text{ SEL} + Z - Y)$, or
	  ➢ $2.45 * (2L112 \text{ NLY} + 0.25 * (5L96 \text{ SEL} + Z) - 400)$, or
	  ➢ $2.45 * (2L112 \text{ NLY} + \text{BDY Gen} + 0.25 * (5L96 \text{ SEL} + Z) - 1170)$, or
	  ➢ $3.10 * (2L293 \text{ SEL} + 0.19 * (5L96 \text{ SEL} + Z) - 400)$, and do not shed WAN for this requirement
	  $Y = \text{Min} (3050, 1800 + 0.60 * \text{REV MW})$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	  $Y = \text{Min} (2790, 1500 + 0.60 * \text{REV MW})$ if none of ACK 5CX1 & 5CX2 is in service.
	  $Z = 48L \text{ KET}$ if DTT 48L is armed, or
	  $Z = 0$ if DTT 48L is not armed
	• If TSA-PM alarms "VIOLATION_5L76_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to bring the flow on 5L76 ACK below the rating within 30 minutes:
	  • Reduce REV or SIE generation, or
	  • Reduce flow on 2L112 from BDY to NLY, or
	  • Reduce import from Alberta

5L98	If VAS-VNT loop is closed, then
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ $1.94 * (5L76 \text{ ACK} + 0.77 * 5L98 \text{ VAS} - 5L76\_Over\_Rating)$
	  ➢ $1.73 * (5L76 \text{ ACK} + 5L98 \text{ VAS} - Y)$, or
	  ➢ $2.71 * (2L112 \text{ NLY} + 0.21 * 5L98 \text{ VAS} - 400)$, or
	  ➢ $2.71 * (2L112 \text{ NLY} + \text{BDY Gen} + 0.21 * 5L98 \text{ VAS} - 1200)$, or
	  ➢ $3.75 * (2L293 \text{ SEL} + 0.17 * 5L98 \text{ VAS} - 400)$, and do not shed WAN for this requirement
	  $Y = (1750 + 0.56 * \text{REV MW})$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	  $Y = (1500 + 0.56 * \text{REV MW})$ if none of ACK 5CX1 & 5CX2 is in service.
	Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ $1.94 * (5L76 \text{ ACK} + 0.77 * 5L98 \text{ VAS} - 5L76\_Over\_Rating)$
	  ➢ $1.70 * (5L76 \text{ ACK} + 5L98 \text{ VAS} - Y)$, or
	  ➢ $2.60 * (2L112 \text{ NLY} + 0.25 * 5L98 \text{ VAS} - 400)$, or
	  ➢ $2.60 * (2L112 \text{ NLY} + \text{BDY Gen} + 0.25 * 5L98 \text{ VAS} - 1200)$, or
	  ➢ $3.60 * (2L293 \text{ SEL} + 0.20 * 5L98 \text{ VAS} - 400)$, and do not shed WAN for this requirement
	  $Y = \text{Min} (2950, 1560 + 0.60 * \text{REV MW})$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	  $Y = \text{Min} (2750, 1360 + 0.60 * \text{REV MW})$ if none of ACK 5CX1 & 5CX2 is in service
	• If TSA-PM alarms "VIOLATION_5L76_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to bring the flow on 5L76 ACK below the rating within 30 minutes:
	  ➢ Reduce REV or SIE generation, or
	  ➢ Reduce flow on 2L112 from BDY to NLY, or
	  ➢ Reduce import from Alberta

CONTINGENCY	SHEDDING REQUIREMENTS
5L96 & 5L98	- Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed. - Shed at KCL/ALH/WAN/BRX first/WAX, then SEV the greatest of: $2.20 * (5L76\ ACK + 0.64 * (5L96\ SEL + Z) - 5L76\_Over\_Rating)$ $1.25 * (5L76\ ACK + 5L96\ SEL + Z - Y)$, or $2.44 * (2L112\ NLY + 0.24 * (5L96\ SEL + Z) - 400)$, or $2.44 * (2L112\ NLY + BDY\ Gen + 0.24 * (5L96\ SEL + Z) - 1350)$, or $2.56 * (2L293\ SEL + 0.18 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement $Y = Min\ (2970, 1570 + 0.64 * REV\ MW)$ if at least one of ACK 5CX1 & 5CX2 is in service, or $Y = Min\ (2770, 1370 + 0.64 * REV\ MW)$ if none of ACK 5CX1 & 5CX2 is in service $Z = 48L\ KET$ if DTT 48L is armed, or $Z = 0$ if DTT 48L is not armed - If TSA-PM alarms "VIOLATION_5L76_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to bring the flow on 5L76 ACK below the rating within 30 minutes: - Reduce REV or SIE generation, or - Reduce flow on 2L112 from BDY to NLY, or - Reduce import from Alberta
5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.14 – 5L83 AND 5L81 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2
- Limit: 5L82 NIC MW <= 5L82_Norm_Rating
  If TSA-PM alarms "VIOLATION_5L82_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to reduce the flow on 5L82 from NIC within its continuous rating:
  - Reduce SI generation and increase LM / VI / Peace generation, or
  - Reduce AB to BC transfer or
  - Reduce ING to CUS transfer
- 5L44 contingency:
  Limit: 2L64 KI2 + 0.19 * 5L44 ING + M <= 2L64_Over_Rating
  Where M is calculated as follows:
  Y = 2L112 BDY + 0.059 * 5L44 ING
  Z = 2L293 NLY + 0.048 * 5L44 ING
  If Y > NLYPST_OL_PickupMW, R1 = 0.139 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
  If Z > 2L293OLRAS_PickupMW, R2 = 0.172 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
  M= Max (R1, R2)

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

Table 2.14 Generation Shedding Requirements
5L83 AND 5L81 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	<u>ACK 5CB8 in service:</u> No Generation shedding <u>ACK 5CB8 O.O.S.:</u> (5L76 contingency will trip open 5L75) • If REV Gen <= 2000 MW, shed at REV: 1.05 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4040) MW AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L79	No Generation shedding.
5L82 (TSA-PM must treat it as "5L81 AND 5L82" contingency to obtain required RAS functions)	Same as 5L81 and 5L82 double contingency in 5L83 O.O.S. Table 1.16 (Note: Note 10 in Section 3 is applicable to this contingency)
Bypass AMC 5CX2, or Bypass AMC 5CX1	No shedding required
5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L87	Shed at MCA/REV: 1.28 * (5L82 NIC + 5L87 NIC – 2700)
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency

5L44	GS1 = 3.5 * (5L41KLY + 0.38 * 5L44MDN – 5L41_Over_Rating)
	GS2 = 9 * (2L20CSQ + 0.26 * 5L44 MDN – 2L20_Over_Rating)
	GS3 = 20.5 * (2L51COK + 0.13 * 5L44MDN - 2L51COK_Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.07 * 5L44 MDN – 0.14* M
	Z = 2L293 SEL + 0.06 * 5L44 MDN – 0.13 * M
	
	If Y > NLYPST_OL PickupMW,
	   R1 = 0.45 * (Y - NLYPST_OL_ResetMW)
	   R3 = 0.15 * (Y - NLYPST OL_ResetMW)
	   R5 = 0.08 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	   R2 = 0.50 * (Z - 2L293OLRAS_ResetMW)
	   R4 = 0.18 * (Z - 2L293OLRAS_ResetMW)
	   R6 = 0.08 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	   ➢ D1 * (GS1 + 3.5* Ra)
	   ➢ D2 * (GS2 + 9* Rb)
	   ➢ D3 * (GS3 + 20.5* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 0.95 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.3 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.5 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L91	Tables A, B, C and D are applicable to this contingency

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➤ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or
	   ➤ $2.59 * (2L112\ NLY + 0.22 * (5L96\ SEL + Z) - 400)$, or
	   ➤ $2.59 * (2L112\ NLY + BDY\ Gen + 0.22 * (5L96\ SEL + Z) - 1180)$, or
	   ➤ $3.34 * (2L293\ SEL + 0.16 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement.
	$Y = 2200$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	$Y = 1900$ if none of ACK 5CX1 & 5CX2 is in service AND all SEL T1 & T2 & T4 are in service
	$Z = 48L\ KET$ if DTT 48L is armed, or
	$Z = 0$ if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➤ $1.86 * (5L91\ SEL + 5L98\ VAS - Y)$, or
	   ➤ $2.78 * (2L112\ NLY + 0.18 * 5L98\ VAS - 400)$, or
	   ➤ $3.82 * (2L293\ SEL + 0.15 * 5L98\ VAS - 400)$, and do not shed WAN for this requirement.
	$Y = 1910$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	$Y = 1800$ if none of ACK 5CX1 & 5CX2 is in service
	Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➤ $1.86 * (5L91\ SEL + 5L98\ VAS - Y)$, or
	   ➤ $2.68 * (2L112\ NLY + 0.21 * 5L98\ VAS - 400)$, or
	   ➤ $3.69 * (2L293\ SEL + 0.17 * 5L98\ VAS - 400)$, and do not shed WAN for this requirement.
	$Y = 1950$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	$Y = 1770$ if none of ACK 5CX1 & 5CX2 is in service

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➤ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or
	   ➤ $2.88 * (2L112\ NLY + 0.25 * (5L96\ SEL + Z) - 400)$, or
	   ➤ $2.88 * (2L112\ NLY + BDY\ Gen + 0.25 * (5L96\ SEL + Z) - 1160)$ or
	   ➤ $3.24 * (2L293\ SEL + 0.19 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement.
	$Y = 2170$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	$Y = 1830$ if none of ACK 5CX1 & 5CX2 is in service
	$Z = 48L\ KET$ if DTT 48L is armed, or
	$Z = 0$ if DTT 48L is not armed

5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.15 – 5L83 AND 5L82 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2
- Limit: 5L81 NIC MW <= 5L81_Norm_Rating
  If TSA-PM alarms "VIOLATION_5L81_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to reduce the flow on 5L81 from NIC within its continuous rating:
  - Reduce SI generation and increase LM / VI / Peace generation, or
  - Reduce AB to BC transfer or
  - Reduce ING to CUS transfer
- 5L44 contingency:
  Limit: 2L64 KI2 + 0.20 * 5L44 ING + M <= 2L64_Over_Rating
  Where M is calculated as follows:
  Y = 2L112 BDY + 0.022 * 5L44 ING
  Z = 2L293 NLY + 0.018 * 5L44 ING
  If Y > NLYPST_OL_PickupMW, R1 = 0.04 * (Y- NLYPST_OL_ResetMW), Else R1 = 0
  If Z > 2L293OLRAS_PickupMW, R2 = 0.050 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
  M= Max (R1, R2)

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements
5L83 AND 5L82 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table 2.14 – 5L83 AND 5L81 O.O.S.
5L79	No Generation shedding.
5L81 (TSA-PM must treat it as "5L81 AND 5L82" contingency to obtain required RAS functions)	Same as 5L81 and 5L82 double contingency in 5L83 O.O.S. Table 1.16 (Note: Note 9 in Section 3 is applicable to this contingency)
Bypass AMC 5CX2, or Bypass AMC 5CX1	No shedding required
5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L87	Shed at MCA/REV: 1.28 * (5L81 NIC + 5L87 NIC – 2700)
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	No generation shedding required.
5L91	Tables A, B, C and D are applicable to this contingency
5L96	Same as Table 2.14 – 5L83 AND 5L81 O.O.S.
5L98	Same as Table 2.14 – 5L83 AND 5L81 O.O.S.
5L96 & 5L98	Same as Table 2.14 – 5L83 AND 5L81 O.O.S.
5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No Shedding required.

Table 2.17 – 5L83 AND 5L87 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: 1. **This generation shedding table is not intended for the extended 5L83 AND 5L87 O.O.S.**
2. **For extended outage of 5L87, pick up the generation shedding table for 5L83 AND 5L87 AND (5L71 or 5L72) O.O.S.**

Pre-Outage Restrictions:

- Notes 2 and 3 in Section 2
- 5L81 & 5L82 contingency:

  If BC is importing from US, then limit total flow on 5L81 AND 5L82 from NIC to:

  - 3300 – (total import from 5L51 AND 5L52 measured at ING) MW

  This limitation is to prevent transient voltage collapse in the ING and MDN areas.

Generation Shedding Requirements
5L83 AND 5L87 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S.: (5L75 contingency will trip open 5L76) • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this Table 2.17.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F

5L76	ACK 5CB8 in service:
	• If REV Gen <= 2000 MW, shed at REV: 1.03 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL − 4270) MW
	
	ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75)
	• Shed at REV: 1.03 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL − Y) MW
	   Y = 3800 if REV Gen <= 2000 MW, or
	   Y = 4100 if REV Gen > 2000 MW
	AND
	• If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.

5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service.

5L81	Shed at MCA/REV: GS + 1.69 * M
	Where GS and M are calculated as follows:
	   GS = Max (0, 1.69 * (5L82 NIC + 0.80 * 5L81 NIC - 5L82_Over_Rating))
	   Y = 2L112 NLY + 0.08 * 5L81 NIC - 0.16 * GS
	   Z = -2L293 NLY + 0.07 * 5L81 NIC - 0.15 * GS
	   If Y > NLYPST_OL_PickupMW, M1 = 0.73 * (Y − NLYPST_OL_ResetMW), Else M1 = 0
	   If Z > 2L293OLRAS_PickupMW, M2 = 0.90 * (Z − 2L293OLRAS_ResetMW), Else M2 = 0
	   M = Max (M1, M2)

5L82	Shed at MCA/REV: GS + 1.71 * M
	Where GS and M are calculated as follows:
	   GS = Max (0, 1.71 * (5L81 NIC + 0.79 * 5L82 NIC - 5L81_Over_Rating))
	   Y = 2L112 NLY + 0.08 * 5L82 NIC - 0.16 * GS
	   Z = -2L293 NLY + 0.07 * 5L82 NIC - 0.15 * GS
	   If Y > NLYPST_OL_PickupMW, M1 = 0.73 * (Y − NLYPST_OL_ResetMW), Else M1 = 0
	   If Z > 2L293OLRAS_PickupMW, M2 = 0.89 * (Z − 2L293OLRAS_ResetMW), Else M2 = 0
	   M = Max (M1, M2)

Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required
5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 MCA, 2 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable. Expect high voltage at NIC and overloading on 1L243, VVW T3, SVA T1/T3, 1L242 and 1L241. Further reduction of SI generation will be required. If TSA-PM alarms "C5L81_82 – MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions: • reduce AB to BC transfer, or • reduce SI and FBC generation The following is the generation shedding requirement: • Arm DTT 2L112 RAS • Arm NIC RX RAS • Shed at MCA/REV/KCL/SEV/ALH/WAN/BRX/WAX: 1.1 * (5L81 NIC + 5L82 NIC + 2L112 NLY) If generation shedding is armed, then • Arm DTT ACK 5CX1 RAS if ACK 5CX1 is in service, and • Arm DTT ACK 5CX2 RAS if ACK 5CX2 is in service Total armed generation shedding is limited to: 2500 MW
5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	No shedding required.
5L91	Tables A, B, C and D are applicable to this contingency

CONTINGENCY	SHEDDING REQUIREMENTS
5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed. • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z − Y), or ➢ 2.40 * (2L112 NLY + 0.23 * (5L96 SEL + Z) − 400), or ➢ 2.40 * (2L112 NLY + BDY Gen + 0.23 * (5L96 SEL + Z) − 1160), or ➢ 3.04 * (2L293 SEL + 0.17 * (5L96 SEL + Z) − 400), and do not shed WAN for this requirement. Y = 1880 if at least one of ACK 5CX1 & 5CX2 is in service, or Y = 1800 if none of ACK 5CX1 & 5CX2 is in service AND all SEL T1 & T2 & T4 are in service Z = 48L KET if DTT 48L is armed, or Z = 0 if DTT 48L is not armed
5L98	If VAS-VNT loop is closed, then • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.60 * (5L91 SEL + 5L98 VAS − Y), or ➢ 2.92 * (2L112 NLY + 0.14 * 5L98 VAS − 400), or ➢ 4.07 * (2L293 SEL + 0.11 * 5L98 VAS − 400), and do not shed WAN for this requirement. Y = 1760 if at least one of ACK 5CX1 & 5CX2 is in service, or Y = 1570 if none of ACK 5CX1 & 5CX2 is in service Otherwise, • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.56 * (5L91 SEL + 5L98 VAS − Y), or ➢ 2.79 * (2L112 NLY + 0.16 * 5L98 VAS − 400), or ➢ 3.92 * (2L293 SEL + 0.12 * 5L98 VAS − 400), and do not shed WAN for this requirement. Y = 1740 if at least one of ACK 5CX1 & 5CX2 is in service, or Y = 1530 if none of ACK 5CX1 & 5CX2 is in service
5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed. • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z − Y), or ➢ 2.49 * (2L112 NLY + 0.26 * (5L96 SEL + Z) − 400), or ➢ 2.49 * (2L112 NLY + BDY Gen + 0.26 * (5L96 SEL + Z) − 1210), or ➢ 2.94 * (2L293 SEL + 0.20 * (5L96 SEL + Z) − 400), and do not shed WAN for this requirement. Y = 1850 if at least one of ACK 5CX1 & 5CX2 is in service, or Y = 1790 if none of ACK 5CX1 & 5CX2 is in service Z = 48L KET if DTT 48L is armed, or Z = 0 if DTT 48L is not armed
5L92	Same as Table A
5L94	Same as Table A
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required

Table 2.18 – 5L83 AND 5L87 AND 5L71 O.O.S., or 5L83 AND 5L87 AND 5L72 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:

- Notes: 2 and 3 in Section 2.
- 5L81 & 5L82 contingency:

  For extended 5L87 outage,
  - The South Interior West 138 kV system must be split using procedure in Section 7.2. The purpose of splitting SIW 138 kV system is to prevent overloading 1L243 and VVW T3 for loss of 5L81 AND 5L82.
  - When 5L83 and 5L87 are O.O.S., one of 5L71 and 5L72 must be taken out of service to control the NIC 500 kV bus voltage.
  - The total flow on 5L81 AND 5L82 must be limited as follows:

    1. If BC is importing from both US AND Alberta, then limit total flow on 5L81 AND 5L82 from NIC to the lesser of:
       - 2500 − 2L112 NLY, or
       - 3300 − (total import from 5L51 AND 5L52 measured at ING) MW.
       These limitations are to prevent transient voltage collapse in the ING and MDN areas or unacceptable transient overvoltage in SI area for loss of 5L81 and 5L82.

    2. If BC is importing from US AND exporting to Alberta, then limit total flow on 5L81 AND 5L82 from NIC to the lesser of:
       - 2500 − 2L112 NLY, or
       - 2600 − BC to AB − 2L112 NLY, or
       - 3300 − (total import from 5L51 AND 5L52 (MW) measured at ING).
       These limitations are to prevent transient voltage collapse in the ING and MDN areas or unacceptable transient overvoltage in SI area for loss of 5L81 AND 5L82.

    3. If BC is exporting to US AND importing from Alberta, then limit total flow on 5L81 AND 5L82 from NIC below:
       - 2500 − 2L112 NLY.
       This limitation is to prevent unacceptable transient overvoltage in SI area for loss of 5L81 AND 5L82.

    4. If BC is exporting to both US AND Alberta, then limit total flow on 5L81 AND 5L82 from NIC to the lesser of:
       - 2500 − 2L112 NLY, or
       - 2600 − BC to AB − 2L112 NLY
       This limitation is to prevent unacceptable transient overvoltage in SI area for loss of 5L81 and 5L82.

- The following system conditions are also required:

  - Limit MCA Gen <= 1100 MW, each of MCA units shall not exceed 450 MW, and 2 MCA units must be in SC mode or generating less than 100 MW each unit.

  - The following reactors must be **in service**:
    - MCA 5RX3 if 5L71 is O.O.S., or MCA 5RX4 if 5L72 is O.O.S.
    - ACK 5RX4, and
    - SEL 5RX2, and
    - CBK 5RX4, 5RX5, and
    - CBK 12RX32

  - All NIC (5RX3, 5RX4, 5RX11), ACK (5RX7, 5RX8) and SEL 5RX3 must be available.

  - CBK 12CX2 and 12CX3 must be out of service.

  - The following pre-contingency voltages must be maintained:
    - MCA   <= 515 kV
    - REV   <= 515 kV
    - NIC   <= 530 kV
    - KCL   <= 237 kV
    - SEV   <= 237 kV

  - If these TSA-PM alarms are received:
    "5L81_82 - INSUFFICIENT GEN SHED ARMED" or/and
    "5L81_82 - MIN UNITS ONLINE VIOLATION"
    the BC Hydro Control Centre staff should take the following actions:
    - reduce import from Alberta, or
    - reduce MW output of minimum units on-line (MUOL), or
    - put more unit(s) at REV and SEV on-line as S/C.

Generation Shedding Requirements
5L83 AND 5L87 AND 5L71 O.O.S. or 5L83 AND 5L87 AND 5L72 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

CONTINGENCY	SHEDDING REQUIREMENTS
5L71 (3P) with 5L72 O.O.S, (TSA-PM must treat it as "5L71 AND 5L72" contingency to obtain required RAS functions)	Same as 5L71 (3P) and 5L72 (3P) contingency in Table E
5L72 (3P) with 5L71 O.O.S, (TSA-PM must treat it as "5L71 AND 5L72" contingency to obtain required RAS functions)	Same as 5L71 (3P) and 5L72 (3P) contingency in Table E
5L71 (1P) with 5L72 O.O.S.	Shed MCA down to 1500 MW.
5L72 (1P) with 5L71 O.O.S.	Same as 5L71 (1P) with 5L72 O.O.S. in this table.
Bypass SYA 5CX1 with 5L72 O.O.S.	Shed MCA down to 1500 MW.
Bypass SYA 5CX2 with 5L71 O.O.S.	Same as Bypass SYA 5CX1 with 5L72 O.O.S. in this table.
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	ACK 5CB8 in service: No gen shedding ACK 5CB8 O.O.S. (5L76 contingency will trip open 5L75): Same as 5L75 (3P) contingency with ACK 5CB5 O.O.S. in this Table
5L79	No gen shedding.

5L81	Shed at MCA/REV: GS + 1.65 * M
	Where GS and M are calculated as follows:
	    GS = Max (0, 1.65 * (5L82 NIC + 0.87 * 5L81 NIC - 5L82_Over_Rating))
	    Y = 2L112 NLY + 0.09 * 5L81 NIC - 0.15 * GS
	    Z = -2L293 NLY + 0.08 * 5L81 NIC - 0.14 * GS
	    If Y > NLYPST_OL_PickupMW, M1 = 0.81 * (Y – NLYPST_OL_ResetMW), Else M1 = 0
	    If Z > 2L293OLRAS_PickupMW, M2 = 0.98 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0
	    M = Max (M1, M2)

5L82	5L71 O.O.S.:
	Shed at MCA/REV: GS + 1.60 * M
	Where GS and M are calculated as follows:
	    GS = Max (0, 1.60 * (5L81 NIC + 0.86 * 5L82 NIC - 5L81_Over_Rating))
	    Y = 2L112 NLY + 0.10 * 5L82 NIC - 0.15 * GS
	    Z = -2L293 NLY + 0.08 * 5L82 NIC - 0.14 * GS
	    If Y > NLYPST_OL_PickupMW, M1 = 0.81 * (Y – NLYPST_OL_ResetMW), Else M1 = 0
	    If Z > 2L293OLRAS_PickupMW, M2 = 0.98 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0
	    M = Max (M1, M2)
	
	5L72 O.O.S.:
	Shed at MCA first, then REV: the same shedding requirement as the condition of 5L71 O.O.S. in this table, and keep a minimum of 2 MCA units on-line post-shedding

Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required.

5L81 and 5L82	• Arm DTT 2L112 RAS
	• Arm NIC RX RAS
	• Shed at MCA/REV/KCL/SEV/ALH/WAN/BRX/WAX: (5L81 + 5L82) NIC + 2L112 NLY – Y + Z
	    Y = 600 + 1/3 * (AB to BC) if Alberta is exporting to BC , or Y = (600 – BC to AB) if BC is exporting to Alberta
	    Z = 0 if MATL120S_PST230 <= 0 MW, or Z = MATL120S_PST230 if MATL120S_PST230 > 0 MW
	If generation shedding is armed, then
	• Arm DTT ACK 5CX1 if ACK 5CX1 is in service, and
	• Arm DTT ACK 5CX2 if ACK 5CX2 is in service, and
	• Keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding.

5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	No shedding required.
5L91	Tables A, B, C and D are applicable to this contingency
5L96	Same as 5L83 AND 5L87 O.O.S. Table 2.17
5L98	Same as 5L83 AND 5L87 O.O.S. Table 2.17
5L96 & 5L98	Same as 5L83 AND 5L87 O.O.S. Table 2.17
5L92	Same as Table A
5L94	Same as Table A
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.19 – 5L83 AND 5L91 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit:
    5L96 SEL < 1300 MW from 1 December to 30 April, or
    5L96 SEL < 1400 MW from 1 May to 30 November
- 5L76 and 5L79 contingency:
    - No 500kV Reactors at ACK in service.
    - Limit total flow on 5L76 and 5L79 from NIC to ACK < 100 MW
- 5L96, or 5L98, or 5L96 & 5L98 contingency:
    - If SEL 5RX3 is available, then limit:
      (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 − 1 SEV @ MIN.MW - Z
      Otherwise, limit:
      (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 − 1 SEV @ MIN.MW − 1 KCL @ MIN.MW - Z

      Where: FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL − 2L286 SEL MW
      FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
    - Alarm if 5L96 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
      if 5L96 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
      If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L96.

      Where:
      Y = AB to BC MW if AB to BC > 0, or
      Y = 0 if AB to BC <= 0 MW
      Z = 48L KET if VAS-WTS loop closed, or
      Z = 0 if VAS-WTS loop open.

- 5L44 contingency:
    Limit: 2L64 KI2 + 0.154 * 5L44 ING + M <= 2L64_Over_Rating
    Where M is calculated as follows:
      Y = 2L112 BDY + 0.031 * 5L44 ING
      Z = 2L293 NLY + 0.026 * 5L44 ING
      If Y > <mark>NLYPST_OL_PickupMW</mark>, R1 = 0.062 * (Y − <mark>NLYPST_OL_ResetMW</mark>), Else R1 = 0
      If Z > 2L293OLRAS_PickupMW, R2 = 0.077 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
      M = Max (R1, R2)

    If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
      - Increase flow on 2L129 ARN, or
      - Increase LM generation, or
      - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements
    5L83 AND 5L91 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
    Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): - If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	ACK 5CB8 in service: No gen shedding. ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75) - Same as 5L75 (3P) contingency with ACK 5CB5 O.O.S. in this table.
5L79	No gen shedding. If TSA-PM alarms "VIOLATION_5L76_NORM_RATING", the BC Hydro Control Centre staff shall reduce REV generation to bring the flow on 5L76 ACK below the rating within 30 minutes.
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required

5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 MCA, 1 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable.
	
	If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	    If BC is exporting to US, then reduce BC to US export.
	    If BC is importing from US, then
	      - reduce (SI and FBC) generation and increase Peace generation, or/and
	      - reduce (SI and FBC) generation and increase import from US.
	
	The following are the generation shedding and RAS arming requirements:
	
	If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then
	    Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN the greater of:
	      - 1.13 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA + 2L112 NLY − 2250], or
	      - 1.15 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY + 2L112 NLY − 3800]
	
	If 2L112 NLY >= 200 AND 0.10 * (5L81 + 5L82) NIC + 2L293 SEL <= 420, then
	    Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN the greater of:
	      - 1.18 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA − 2250], or

CONTINGENCY	SHEDDING REQUIREMENTS
	• 1.20 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY – 3800] Arm DTT 2L112 RAS, If • 2L112 NLY < 200 AND generation shedding is required, or • 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420 The total armed generation shedding must be limited to 2500 MW
5L76 and 5L79	Same as 5L91 O.O.S. Table 1.19.
5L87	Shed at MCA/REV: 1.11 * ((5L81 + 5L82 + 5L87) NIC - 4050) MW

5L44	GS1 = 3.5 * (5L81NIC + 0.3 * 5L44MDN – 5L81_Over_Rating)
	GS2 = 14.5 * (2L20CSQ + 0.22 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 37.5 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.12* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.10 * M
	
	If Y > NLYPST_OL_PickupMW,
	   R1 = 0.4 * (Y - NLYPST_OL_ResetMW)
	   R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	   R5 = 0.05 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	   R2 = 0.48 * (Z - 2L293OLRAS_ResetMW)
	   R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	   R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	   ➢ D1 * (GS1 + 3.5* Ra)
	   ➢ D2 * (GS2 + 14.5* Rb)
	   ➢ D3 * (GS3 + 37.5* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.65 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.1 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L96 (TSA-PM must treat it as "5L91 AND 5L96" contingency because "5L96" signal won't be generated as long as 5L91 O.O.S.)	Tables A, B, C and D for contingency 5L91 AND 5L96 are applicable to this contingency
5L98	Same as 5L91 O.O.S. Table 1.19.
5L96 & 5L98	Same as 5L91 O.O.S. Table 1.19.

5L92	(Note: Arming requirements for DTT 5L94, DTT 1L274 and DTT 1L275 are included in SOO 7T-17)
	Arm DTT 2L112 RAS if
	   ➢ (0 < AB to BC <= 100 MW) AND (2L293 NLY > 400 – 0.7 * 5L92 CBK MW), or
	   ➢ (AB to BC > 100 MW) AND (2L293 NLY > 400 – 5L92 CBK + 0.68 * (AB to BC) MW), or
	   ➢ (0 <= BC to AB <= 100 MW) AND (2L293 SEL > 400 – 0.87 * 5L92 SEL + 0.2 * (BC to AB) MW), or
	   ➢ (BC to AB > 100 MW) AND (2L293 SEL > 400 – 5L92 SEL + 0.7 * (BC to AB) MW)

5L94	Same as 5L91 O.O.S. Table 1.19.
Bypass GUI	No shedding required.
5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.20 – 5L83 AND 5L96 O.O.S. (Any Status of VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Transfer limit on 5L91 SEL:
  If higher transfer on 5L91 SEL is required than the limit shown in the table below for the VAS-WTS loop closed, the Operator should work with FBC to open the VAS-WTS loop (FBC chose the location to open).

Y = FBC's Load calculated by (2L263 VNT + 2L264 VNT + 34L WTS – 5L98 VAS) MW

Status of VAS-WTS Loop	ACK 5CX1 / 5CX2 In-Service Unit Number	Transfer Limit on 5L91 SEL (MW)	
		Y <= 380 MW	Y > 380 MW
Both Loops Closed (Status A)	>= 1	1450 (to avoid ASM T1/T2 OL)	1300 (to avoid ASM T1/T2 OL)
	0	1450 (to avoid ASM T1/T2 OL)	1300 (to avoid ASM T1/T2 OL)
VAS-WTS Open and VAS-VNT Closed (Status B)	>= 1	1800 (to avoid SEL500 < 1.0 pu)	1530 (to avoid SEL500 < 1.0 pu)
	0	1700 (to avoid SEL500 < 1.0 pu)	1360 (to avoid SEL500 < 1.0 pu)
VAS-WTS Closed and VAS-VNT Open (Status C)	>= 1	1450 (to avoid ASM T1/T2 OL)	1300 (to avoid ASM T1/T2 OL See Note (a) below)
	0	1450 (to avoid ASM T1/T2 OL)	1300 (to avoid ASM T1/T2 OL See Note (b) below)
Both Loops Open (Status D)	>= 1	1800 (to avoid SEL500 < 1.0 pu)	1460 (to avoid SEL500 < 1.00 pu), (See Note (a) below)
	0	1700 (to avoid SEL500 < 1.0 pu)	1360 (to avoid SEL500 < 1.00 pu), (See Note (b) below)

Note (a): With VAS-VNT loop open, this limit is based on the condition that the FBC's load supplied from VNT is reduced down to 300 MW to maintain voltages in this area above 220 kV.

Note (b): With VAS-VNT loop open, this limit is based on the condition that the FBC's load supplied from VNT is reduced down to 270 MW to maintain voltages in this area above 220 kV.

If alarm comes, the BC Hydro Operator should reduce the flow on 5L91 by:
- Reducing Alberta to BC transfer, and/or
- Reducing FBC's power injection into SEL, and/or
- Reducing SEV / KCL generation, and/or
- Adjusting NLY PST to increase 2L112 (NLY to BDY) transfer.

- 5L76 and 5L79 contingency:
  Note: Y = 1L209 SAM if 1L209 is not radial, or Y = 0 if 1L209 is radial.
  U = 48L KET if VAS-WTS loop is closed, or U = 0 if VAS-WTS loop is open
  W = 73L RGA if VAS-VNT loop is closed, or W = 0 if VAS-VNT loop is open
  - Limit: 5L76 ACK + 5L79 ACK + 2L112 NLY + Y + 1L214 VNT + U - W < 2500 MW
  - Alarm if 5L76 ACK + 5L79 ACK + 2L112 NLY + Y + 1L214 VNT + U - W < -700 MW AND MATL120S_PST230 >= 0 MW, or
    if 5L76 ACK + 5L79 ACK + 2L112 NLY + Y + 1L214 VNT + U - W + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    If the alarm comes, the BC Hydro Control Centre staff must put more REV or/and SIE generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L76 and 5L79 with 1L209, 1L214 and 2L112 transfer tripped.
  - At least two of ACK 5RX4 and 5RX7 and 5RX8 must be available.

- 5L91 contingency:
  - If SEL 5RX3 is available, then limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW
    Otherwise, limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW – 1 KCL @ MIN.MW
    Where: FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW
    FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
    Y = AB to BC MW if AB to BC > 0, or
    Y = 0 if AB to BC <= 0
  - Alarm if 5L91 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
    if 5L91 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    Z = 48L KET if VAS-WTS loop is closed, or Z = 0 if VAS-WTS loop is open
    If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91.

- 5L44 contingency:
  Limit: 2L64 KI2 + 0.156 * 5L44 ING + M <= 2L64_Over_Rating
  Where M is calculated as follows:
  Y = 2L112 BDY + 0.028 * 5L44 ING
  Z = 2L293 NLY + 0.023 * 5L44 ING
  If Y > NLYPST_OL_PickupMW, R1 = 0.059 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
  If Z > 2L293OLRAS_PickupMW: R2 = 0.074 * (Z – 2L293OLRAS_ResetMW), Else R2 = 0
  M = Max (R1, R2)

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements
  (5L83 AND 5L96 O.O.S. (Any status of VAS-WTS and VAS-VNT Loops))
  Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F

5L76	ACK 5CB8 in service:
	  Shed at REV: 1.03 * ((5L75 + 5L77) REV + 5L91SEL – 3260) MW
	
	ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75)
	• Shed at REV: 1.03 * ((5L75 + 5L77) REV + 5L91 SEL – Y) MW
	    Y = 2770 if REV Gen <= 2000 MW, or
	    Y = 2690 if REV Gen > 2000 MW
	  AND
	• If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.

5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service in this table.

5L81	Shed at MCA/REV: GS + 3.44 * M
	Where GS and M are calculated as follows:
	  GS = Max (0, 3.44 * (5L82 NIC + 0.45 * 5L81 NIC - 5L82_Over_Rating))
	  Y = 2L112 NLY + 0.05 * 5L81 NIC - 0.14 * GS
	  Z = -2L293 NLY + 0.04 * 5L81 NIC - 0.13 * GS
	  If Y > NLYPST_OL_PickupMW, M1 = 0.31 * (Y – NLYPST_OL_ResetMW), Else M1 = 0
	  If Z > 2L293OLRAS_PickupMW, M2 = 0.38 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0
	  M = Max (M1, M2)

5L82	Shed at MCA/REV: GS + 3.46 * M
	Where GS and M are calculated as follows:
	  GS = Max (0, 3.46 * (5L81 NIC + 0.43 * 5L82 NIC - 5L81_Over_Rating))
	  Y = 2L112 NLY + 0.05 * 5L82 NIC - 0.14 * GS
	  Z = -2L293 NLY + 0.04 * 5L82 NIC - 0.13 * GS
	  If Y > NLYPST_OL_PickupMW, M1 = 0.31 * (Y – NLYPST_OL_ResetMW), Else M1 = 0
	  If Z > 2L293OLRAS_PickupMW, M2 = 0.39 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0
	  M = Max (M1, M2)

Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required
5L81 and 5L82	Same as Table 2.19 – 5L83 AND 5L91 O.O.S.
5L76 and 5L79	Same as 5L96 O.O.S. Table 1.20.
5L87	Shed at MCA/REV: 1.1 * ((5L81 + 5L82 + 5L87) NIC - 3900) MW
5L44	Same as Table 2.19 – 5L83 AND 5L91 O.O.S.
5L91 (TSA-PM must treat it as "5L91 AND 5L96" contingency because "5L91" signal won't be generated as long as 5L96 O.O.S.)	Same as 5L96 O.O.S. Table 1.20.

5L98
(TSA-PM must treat it as "5L96 AND 5L98" contingency because "5L98" signal won't be generated as long as 5L96 O.O.S.)
	Note to FBC: When both VAS-WTS and VAS-VNT loops are open, 5L98 contingency with 5L96 already out of service will black out the FBC's loads which are radially connected to VAS. When VAS-VNT loop is open and VAS-WTS loop is closed, 5L98 contingency may cause overloading on ASM T1/T2, or voltage instability in the area which is radially supplied from WTS.
	
	• Arm DTT 48L RAS if both VAS-WTS and VAS-VNT loops are closed and 5L91 SEL > 700 MW.
	• Shed at KCL/ALH/BRX/WAN/WAX first, then SEV the greatest of:
	    • 1.25 * (5L91 SEL + Z - Y), or
	    • 2.37 * (2L112 NLY + 0.24 * Z – 400), or
	    • 3.05 * (2L293 SEL + 0.17 * Z – 400), and do not shed WAN for this requirement
	    Y = 1600 if at least 1 ACK 5CX1 and 5Cx2 is in service, or
	    Y = 1300 if none of ACK 5CX1 and 5Cx2 is in service
	    Z = 48L KET if DTT 48L RAS is armed, or
	    Z = 0 if DTT 48L RAS is not armed.

5L92	Same as Table 1.19 5L91 O.O.S.
5L94	Same as 5L96 O.O.S. Table 1.20.
Bypass GUI	No shedding required.
5L91 (1P) or 5L98 (1P)	Shed at KCL/SEV/ALH/BRX/WAN/WAX: 1.35 * (5L91 SEL – 1500) MW

Table 2.21 – 5L83 AND 5L98 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Transfer limit on (5L91 + 5L96) SEL:
  The limit is to avoid VAS500 < 1.00 pu with VAS-VNT loop closed, or avoid SEL500 < 1.00 pu with VAS-VNT loop open.

  Y = FBC's Load calculated by (2L263 VNT + 2L264 VNT + 34L WTS +5L96 SEL) MW

| ACK 5CX1 / 5CX2 | Transfer Limit on (5L91 + 5L96) SEL (MW) | |
In-Service Unit Number	Y <= 380 MW	Y > 380 MW
>= 1	1900	1640 See Note (a) below
0	1850	1500 See Note (b) below

  Note (a): When VAS-VNT loop is open, this limit is based on the condition that 73L DGB-RGA circuit is open and the FBC's load supplied from VNT is reduced down to 290 MW to maintain voltages in this area above 220 kV.
  Note (b): When VAS-VNT loop is open, this limit is based on the condition that 73L DGB-RGA circuit is open and the FBC's load supplied from VNT is reduced down to 270 MW to maintain voltages in this area above 220 kV.

  If alarm comes, the BC Hydro Operator should reduce the flow on 5L91 by:
  - Reducing Alberta to BC transfer, and/or
  - Reducing FBC's power injection into SEL, and/or
  - Reducing SEV / KCL generation, and/or
  - Adjusting NLY PST to increase 2L112 (NLY to BDY) transfer.

- 5L76 and 5L79 contingency:
  Note: Y = 1L209 SAM if 1L209 is not radial, or Y = 0 if 1L209 is radial

  - Limit: 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y < 2500 MW
  - Alarm if 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y < -700 MW AND MATL120S_PST230 >= 0 MW, or
    if 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    If the alarm comes, the BC Hydro Control staff must put more REV or/and SIE generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L76 and 5L79 with 1L209, 1L214 and 2L112 transfer tripped.
  - At least two of ACK 5RX4 and 5RX7 and 5RX8 must be available.
- 5L91, or 5L91 AND 5L96 contingency:
  - If SEL 5RX3 is available, then limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW - Z
    Otherwise, limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 KCL @MIN.MW - Z
    Where FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW
    FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
    Y = AB to BC MW if AB to BC > 0, or
    Y = 0 if AB to BC <= 0
    If both VAS-WTS and VAS-VNT loops are closed, then Z = 48L KET, otherwise, Z = 0
  - Alarm if 5L91 SEL + 5L96 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
    if 5L91 SEL + 5L96 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    If both VAS-WTS and VAS-VNT loops are closed, then Z = 48L KET, otherwise, Z = 0.
    If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91, or 5L91 and 5L96.

Generation Shedding Requirements
(5L83 AND 5L98 O.O.S (Any Status of FBC's VAS-WTS and VAS-VNT Loops))
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	<u>ACK 5CB5 in service:</u> Same as Table F <u>ACK 5CB5 O.O.S.</u> (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) AND 5L77 (3P)	Same as Table F
5L75 (3P) AND 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F

5L76	<u>ACK 5CB8 in service:</u>
	Shed at REV: 1.02 * ((5L75 + 5L77) REV + 5L91 SEL – 3150) MW
	
	<u>ACK 5CB8 O.O.S.:</u> (5L76 contingency will trip open 5L75)
	• Shed at REV: 1.02 * ((5L75 + 5L77) REV + 5L91 SEL – Y) MW
	      Y = 2800 if REV Gen <= 1500, or
	      Y = 2650 if REV Gen > 1500
	   AND
	• If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.

5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service in this table.
5L81	Same as Table 2.20 – 5L83 AND 5L96 O.O.S
5L82	Same as Table 2.20 – 5L83 AND 5L96 O.O.S
Bypass AMC 5CX1 or Bypass AMC 5CX2	No shedding required.
5L81 and 5L82	Same as Table 2.19 – 5L83 AND 5L91 O.O.S.
5L76 and 5L79	Same as Table 1.21 – 5L98 O.O.S
5L87	Same as 5L83 AND 5L96 O.O.S. Table 2.20
5L91 and 5L96	Same as Table 1.21 – 5L98 O.O.S
5L44	Same as Table 2.19 – 5L83 AND 5L91 O.O.S.
5L91	Same as Table 1.21 – 5L98 O.O.S

5L96
(TSA-PM must treat it as "5L96 AND 5L98" contingency because "5L96" signal won't be generated as long as 5L98 O.O.S.)
	• Arm DTT 48L RAS if both VAS-WTS and VAS-VNT loops are closed and 5L91 SEL > 700 MW.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    • 1.25 * (5L91 SEL + 5L96 SEL + Z - Y), or
	    • 2.37 * (2L112 NLY + 0.24 * (5L96 SEL + Z) – 400), or
	    • 2.37 * (2L112 NLY + BDY Gen + 0.24 * (5L96 SEL + Z) – 1120), or
	    • 3.05 * (2L293 SEL + 0.17 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	   Y = 1600 if at least one of ACK 5CX1 & 5CX2 is in service, or
	   Y = 1300 if none of ACK 5CX1 & 5CX2 is in service
	   Z = 48L KET if DTT 48L RAS is armed, or
	   Z = 0 if DTT 48L RAS is not armed.
	
	Note: When both VAS-WTS and VAS-VNT loops are open, 5L96 contingency with 5L98 already out of service will black out the FBC's loads which are radially connected to VAS. When VAS-VNT loop is open and VAS-WTS loop is closed, 5L96 contingency may cause overloading on ASM T1/T2, or voltage instability in the area which is radially supplied from WTS.

5L92	Same as Table 2.19 – 5L83 AND 5L91 O.O.S.
5L94	Same as 5L96 O.O.S. Table 1.20.
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P)	Shed at KCL/SEV/ALH/BRX/WAN/WAX: 1.35 * (5L91 SEL – 1500) MW

Table 2.22 – 5L83 AND 5L96 AND 5L98 O.O.S. (Any Status of VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Transfer limit on 5L91 SEL:
  If higher transfer on 5L91 SEL is required than the limit shown in the table below for the VNT-VAS-WTS loop closed, the VNT-VAS-WTS loop must be open (FBC chose the location to open to assure the voltages in their Okanagan area above 220 kV).

Y = FBC's Load calculated by (2L263 VNT + 2L264 VNT + 34L WTS) MW

Status of VNT-VAS-WTS Loop	ACK 5CX1 / 5CX2 In-Service Unit Number	Transfer Limit on 5L91 (MW)	
		Y <= 380 MW	Y > 380 MW
Closed	>= 1	1350 (to avoid ASM T1/T2 OL)	800 (to avoid BEN230 < 220 kV, see Note (a) below)
	0	1350 (to avoid ASM T1/T2 OL)	750 (to avoid BEN230 < 220 kV, see Note (a) below)
Open	>= 1	1850 (to avoid SEL500 < 1.0 pu)	1650 if 2 ACK CXs are in service, or 1550 if 1 ACKCX is in service (to avoid BEN230- RGA230-LEE230 < 220 kV, see Notes (a & b) below)
	0	1800 (to avoid SEL500 < 1.0 pu)	1350 (to avoid BEN230-RGA230-LEE230 < 220 kV, see Notes (a & b & c) below)

Note (a): This limit is based on the condition per FBC's OO 2P-21 that the FBC's South Okanagan load (RGA plus BEN load) is reduced down to 170 MW to maintain voltage stability in this area.

Note (b): This is based on the condition that 48L is open and 42L is meshed, or 40L open and 42L not meshed so that the charging of 75L and 76L would help to maintain RGA230 voltage above 220 kV.

Note (c): This limit is based on the FBC's Kelowna load down to 290 MW to maintain voltage stability in this area.

If alarm comes, the BC Hydro Control Centre staff should reduce the flow on 5L91 by:
- Reducing Alberta to BC transfer, and/or
- Reducing FBC's power injection into SEL, and/or
- Reducing SEV / KCL generation, and/or
- Adjusting NLY PST to increase 2L112 (NLY to BDY) transfer.

- 5L76 and 5L79 contingency:
  Note: Y = 1L209 SAM if 1L209 is not radial, or Y = 0 if 1L209 is radial

  - Limit: 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y < 2500 MW
  - Alarm if 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y < -700 MW AND MATL120S_PST230 >= 0 MW, or
    if 5L76 ACK + 5L79 ACK + 2L112 NLY + 1L214 VNT + Y + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    If the alarm comes, the BC Hydro Control Centre staff must put more REV or/and SIE generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L76 and 5L79 with 1L209, 1L214 and 2L112 transfer tripped.
  - At least two of ACK 5RX4 and 5RX7 and 5RX8 must be available.
- 5L91 contingency:
  - If SEL 5RX3 is available, then limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 − 1 SEV @ MIN.MW - Z
    Otherwise, limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 − 1 SEV @ MIN.MW − 1 KCL @MIN.MW - Z
    Where FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL − 2L286 SEL MW
      FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
      Y = AB to BC MW if AB to BC > 0, or
      Y = 0 if AB to BC <= 0
      Z = 48L KET if WTS-VAS-VNT loop is closed, or
      Z = 0 if WTS-VAS-VNT loop is open
  - Alarm if 5L91 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
        if 5L91 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    Z = 48L KET if WTS-VAS-VNT loop is closed, or
    Z = 0 if WTS-VAS-VNT loop is open
    If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91.

Generation Shedding Requirements
(5L83 AND 5L96 AND 5L98) O.O.S (Any Status of VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	Same as Table 2.20 – 5L83 AND 5L96 O.O.S.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	Same as Table 2.20 – 5L83 AND 5L96 O.O.S.
5L79	Same as Table 2.20 – 5L83 AND 5L96 O.O.S.
5L81	Same as Table 2.20 – 5L83 AND 5L96 O.O.S.
5L82	Same as Table 2.20 – 5L83 AND 5L96 O.O.S.
Bypass AMC 5CX1 or Bypass AMC 5CX2	No shedding required.
5L81 and 5L82	Same as Table 2.19 – 5L83 AND 5L91 O.O.S.
5L76 and 5L79	Same as Table 1.22 – 5L96 AND 5L98 O.O.S.
5L87	Same as Table 1.20 - 5L96 O.O.S.
5L91 (TSA-PM must treat it as "5L91 AND 5L96" contingency because "5L91" signal won't be generated as long as 5L96 O.O.S.)	Same as Table 1.22 – 5L96 AND 5L98 O.O.S.
5L44	Same as Table 2.19 – 5L83 AND 5L91 O.O.S.
5L92	Same as Table 2.19 – 5L83 AND 5L91 O.O.S.
5L94	Same as Table 2.20 – 5L83 AND 5L96 O.O.S.
Bypass GUI 5CX1	No shedding required.
5L91(1P)	Shed at KCL/SEV/ALH/BRX/WAN/WAX: 1.35 * (5L91 SEL – 1500) MW

Table 2.23 – 5L83 AND 5L92 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 in Section 2
- 5L91 and 5L96 contingency:
    - Limit: 5L91 SEL + 5L96 SEL + Y + Z < 2500 MW
        - limit:
        FBC injection into SEL area < WAN shedable generation amount + ALH MW + BRX MW + WAX MW
        $$- \text{Min (1 SEV@MIN\_MW, 1 KCL @MIN\_MW)} - Z + W$$

        Y = 2L112 NLY if 2L112 NLY > 0, or
        Y = 0 if 2L112 NLY <= 0
        Z = 48L KET if VAS-WTS loop closed, or
        Z = 0 if VAS-WTS loop open
        W is the lesser of:
        - 2L294_Over_Rating, or
        - 2L294 NLY + CBK 500 kV to 230 kV MW + 1L274 POC – 1L275 NTL + 100
        FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW
        FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW

- 5L44 contingency:
    Limit: 2L64 KI2 + 0.155 * 5L44 ING + M <= 2L64_Over_Rating
    Where M is calculated as follows:
    Y = 2L112 BDY + 0.031 * 5L44 ING
    Z = 2L293 NLY + 0.033 * 5L44 ING
    If Y > NLYPST_OL_PickupMW, R1 = 0.064 * (Y- NLYPST_OL_ResetMW), Else R1 = 0
    If Z > 2L293OLRAS_PickupMW, R2 = 0.082 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
    M = Max (R1, R2)

    If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
    - Increase flow on 2L129 ARN, or
    - Increase LM generation, or
    - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements
5L83 AND 5L92 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this Table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	
5L75 (3P) and 5L77 (3P)	Same as Table F

5L76	ACK 5CB8 is in service:
	If REV Gen <= 2000 MW, then shed at REV: 1.03 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4050) MW
	
	ACK 5CB8 is O.O.S.: (5L76 contingency will trip open 5L75)
	Shed at REV: 1.03 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – Y) MW
	    Y = 3570 if REV Gen <= 2000 MW, or
	    Y = 3770 if REV Gen > 2000 MW
	  AND
	• If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.

5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service.
5L81	Shed at MCA/REV: GS + 3.17 * M Where GS and M are calculated as follows: GS = Max (0, 3.17 * (5L82 NIC + 0.45 * 5L81 NIC - 5L82_Over_Rating)) Y = 2L112 NLY + 0.06 * 5L81 NIC - 0.15 * GS Z = -2L293 NLY + 0.06 * 5L81 NIC - 0.21 * GS If Y > NLYPST_OL_PickupMW, M1 = 0.39 * (Y – NLYPST_OL_ResetMW), Else M1 = 0 If Z > 2L293OLRAS_PickupMW, M2 = 0.48 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0 M = Max (M1, M2)
5L82	Shed at MCA/REV: GS + 3.23 * M Where GS and M are calculated as follows: GS = Max (0, 3.23 * (5L81 NIC + 0.43 * 5L82 NIC - 5L81_Over_Rating)) Y = 2L112 NLY + 0.05 * 5L82 NIC - 0.15 * GS Z = -2L293 NLY + 0.06 * 5L82 NIC - 0.21 * GS If Y > NLYPST_OL_PickupMW, M1 = 0.38 * (Y – NLYPST_OL_ResetMW), Else M1 = 0 If Z > 2L293OLRAS_PickupMW, M2 = 0.47 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0 M = Max (M1, M2)
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required.
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L76 and 5L79	Same as 5L92 O.O.S. Table 1.23.
5L87	Shed at MCA/REV: 1.1 * ((5L81 + 5L82 + 5L87) NIC – 4350) MW
5L91 and 5L96	Same as 5L92 O.O.S. Table 1.23

CONTINGENCY	SHEDDING REQUIREMENTS

5L44	GS1 = 3.5 * (5L81NIC + 0.3 * 5L44MDN – 5L81_Over_Rating)
	GS2 = 14.5 * (2L20CSQ + 0.22 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 37.5 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.13* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.14 * M
	
	If Y > NLYPST_OL_PickupMW,
	   R1 = 0.42 * (Y - NLYPST_OL_ResetMW)
	   R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	   R5 = 0.05 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	   R2 = 0.5 * (Z - 2L293OLRAS_ResetMW)
	   R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	   R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	   ➢ D1 * (GS1 + 3.5* Ra)
	   ➢ D2 * (GS2 + 14.5* Rb)
	   ➢ D3 * (GS3 + 37.5* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.65 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.1 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	   • Reduce the flow on 2L129 from ARN to VIT.
	   • Reduce SI generation and increase Peace generation

5L91	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➢ 1.35 * (5L91 SEL+5L96 SEL – Y) MW, or
	   ➢ 3.16 * (2L112 NLY + 0.19 * 5L91 SEL – 400), or
	   ➢ 2.60 * (2L293 SEL + 0.23 * 5L91 SEL – 400), and do not shed WAN for this requirement.
	   Y = 1700 if SEL T1 & (T2 or/and) & T4 are in service, or
	   Y = 1635 if SEL T1 or (T2 & T3) or T4 is O.O.S.

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➢ 1.25 * (5L91 SEL+5L96 SEL + Z – Y), or
	   ➢ 2.30 * (2L112 NLY + BDY GEN + 0.24*(5L96 SEL + Z) – 1100)
	   ➢ 2.30 * (2L112 NLY + 0.24 * (5L96 SEL + Z) – 400), or
	   ➢ 2.66 * (2L293 SEL + 0.19 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	   Y = 2020 if at least one of ACK 5CX1 & 5CX2 is in service, or
	   Y = 1800 if none of ACK 5CX1 & 5CX2 is in service
	   Z = 48L KET if DTT 48L is armed, or
	   Z = 0 if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➢ 1.18 * (5L91 SEL + 5L98 VAS – Y)
	   ➢ 3.10 * (2L112 NLY + 0.17 * 5L98 VAS – 400), or
	   ➢ 4.36 * (2L293 SEL + 0.15 * 5L98 VAS – 400), and do not shed WAN for this requirement.
	   Y = 1970 if at least one of ACK 5CX1 & 5CX2 is in service, or
	   Y = 1880 if none of ACK 5CX1 & 5CX2 is in service
	Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➢ 1.14 * (5L91 SEL + 5L98 VAS – Y)
	   ➢ 3.48 * (2L112 NLY + 0.20 * 5L98 VAS – 400), or
	   ➢ 4.00 * (2L293 SEL + 0.18 * 5L98 VAS – 400), and do not shed WAN for this requirement.
	   Y = 2050 if at least one of ACK 5CX1 & 5CX2 is in service, or
	   Y = 1930 if none of ACK 5CX1 & 5CX2 is in service.

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	   ➢ 1.25 * (5L91 SEL+5L96 SEL +Z – Y), or
	   ➢ 2.60 * (2L112 NLY + BDY GEN + 0.27 * (5L96 SEL + Z) – 1190), or
	   ➢ 2.60 * (2L112 NLY + 0.27 * (5L96 SEL + Z) – 400), or
	   ➢ 3.02 * (2L293 SEL + 0.21 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	   Y = 1990 if at least one of ACK 5CX1 & 5CX2 is in service, or
	   Y = 1720 if none of ACK 5CX1 & 5CX2 is in service
	   Z = 48L KET if DTT 48L is armed, or
	   Z = 0 if DTT 48L is not armed

5L94	(Note: Arming requirements for DTT 1L274 and DTT 1L275 are included in SOO 7T-17.) • If (BC to US + BC to AB) > 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: (BC to AB) MW
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.24 – 5L83 AND 5L94 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 in Section 2
- 5L91 and 5L96 contingency:
  - If SEL 5RX3 is available, then limit:
    - (FBC injection into SEL area) < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 350 + Y - Z,
  - Otherwise, limit:
    - (FBC injection into SEL area) < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 350 – 1 SEV@MIN_MW + Y – Z

  Where: FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL MW – 60L227 KCL – 2L286 SEL MW

  FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW

  Y = AB to BC MW if AB to BC > 0 MW, or
  Y = 0 if AB to BC <= 0 MW
  Z = 48L KET if VAS-WTS loop is closed, or
  Z = 0 if VAS-WTS loop is open.

- 5L44 contingency:
  - Limit: 2L64 KI2 + 0.155 * 5L44 ING + M <= 2L64_Over_Rating
  - Where M is calculated as follows:
    - Y = 2L112 BDY + 0.032 * 5L44 ING
    - Z = 2L293 NLY + 0.027 * 5L44 ING
    - If Y > NLYPST_OL_PickupMW, R1 = 0.066 * (Y- NLYPST_OL_ResetMW), Else R1 =0
    - If Z > 2L293OLRAS_PickupMW, R2 = 0.083 * (Z – 2L293OLRAS_ResetMW), Else R2 = 0
    - M = Max (R1, R2)

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements
5L83 AND 5L94 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this Table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	ACK 5CB8 is in service: No gen shedding ACK 5CB8 is O.O.S.: (5L76 contingency will trip open 5L75) • Shed at REV: 1.03 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 3915) MW AND If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L79	No generation shedding
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required

CONTINGENCY	SHEDDING REQUIREMENTS

5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 MCA, 2 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable.
	
	If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	    If BC is exporting to US, then reduce BC to US export.
	    If BC is importing from US, then
	        • reduce (SI and FBC) generation and increase Peace generation, or/and
	        • reduce (SI and FBC) generation and increase import from US
	
	The following are the generation shedding and RAS arming requirements:
	
	If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then GS is the greater of:
	• 1.13 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA + 2L112 NLY – 2250], or
	• 1.15 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY + 2L112 NLY – 3800]
	
	If 2L112 NLY >= 200 AND 0.10 * (5L81 + 5L82) NIC + 2L293 SEL <= 420, then GS is the greater of:
	• 1.18 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA – 2250], or
	• 1.20 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY – 3800]
	
	If GS >= 500 MW, then
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS + (BC_AB)
	• Total armed generation shedding must be limited to 2500 + (BC_AB)
	
	If GS < 500 , then shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: GS
	
	Arm DTT 2L112 RAS, If
	• 2L112 NLY < 200 AND GS > 0 , or
	• 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420

5L76 and 5L79	Same as 5L94 O.O.S. Table 1.24
5L87	Same as 5L83 O.O.S. Table 1.16

5L91 and 5L96	• Arm DTT 48L RAS if VAS-WTS loop is closed.
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17
	• Shed at KCL/ALH/SEV/WAN/BRX/WAX:
	  1.02 x (5L91 SEL + 5L96 SEL + Z) + 2L112 NLY – 1L274 POC + 1L275 NTL + 70 - Y
	  Y is the lesser of:
	    • 400 MW, or
	    • 1200 - BDY gen MW
	  Z = 48L KET if DTT 48L RAS is armed, or
	  Z = 0 if DTT 48L RAS is not armed.
	  KCL may be shed down to 0 MW.
	  If SEL 5RX3 is available, then SEV may be shed down to 0 MW, otherwise keep a minimum of 1 SEV unit on line post shedding.
	  Total armed generation shedding must be limited to: 2500 – 1L274 POC + 1L275 NTL
	• If TSA-PM alarms "insufficient shedding", the BC Hydro Control Centre staff must request FBC to reduce the generation of the BRD/COR/UBO/LBO/SLC, or/and the WAN unit not armed for shedding, or run one additional SEV unit as sync if SEL 5RX3 is unavailable.

5L44	Same as Table 2.23 – 5L83 AND 5L92 O.O.S.

5L91	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    ➢ 1.28 * (5L91 SEL + 5L96 SEL – Y), or
	    ➢ 3.30 * (2L112 NLY + 0.20 * 5L91 SEL – 400), or
	    ➢ 3.70 * (2L293 SEL + 0.19 * 5L91 SEL – 400), and do not shed WAN for this requirement.
	  Y = 1715 if all SEL T1 & (T2 or/and T3) & T4 are in service, or
	  Y = 1620 if SEL T1 or (T2 & T3) or T4 is O.O.S..

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z – Y)
	    ➢ 2.88 * (2L112 NLY + 0.21 * (5L96 SEL + Z) – 400), or
	    ➢ 2.88 * (2L112 NLY + BDY Gen + 0.21 * (5L96 SEL + Z) – 1200), or
	    ➢ 3.38 * (2L293 SEL + 0.15 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	  Y = 2080 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1760 if none of ACK 5CX1 & 5CX2 is in service
	  Z = 48L KET if DTT 48L is armed, or
	  Z = 0 if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    ➢ 1.18 * (5L91 SEL + 5L98 VAS – Y), or
	    ➢ 3.11 * (2L112 NLY + 0.17 * 5L98 VAS – 400), or
	    ➢ 4.35 * (2L293 SEL + 0.14 * 5L98 VAS – 400), and do not shed WAN for this requirement.
	  Y = 2000 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1860 if none of ACK 5CX1 & 5CX2 is in service.
	Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    ➢ 1.14 * (5L91 SEL + 5L98 VAS – Y), or
	    ➢ 3.05 * (2L112 NLY + 0.20 * 5L98 VAS – 400), or
	    ➢ 4.28 * (2L293 SEL + 0.16 * 5L98 VAS – 400), and do not shed WAN for this requirement.
	  Y = 2080 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1960 if none of ACK 5CX1 & 5CX2 is in service.

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	    ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z – Y)
	    ➢ 3.14 * (2L112 NLY + 0.24 * (5L96 SEL + Z) – 400), or
	    ➢ 3.14 * (2L112 NLY + BDY Gen + 0.24 * (5L96 SEL + Z) – 1230), or
	    ➢ 3.28 * (2L293 SEL + 0.17 * (5L96 SEL + Z) – 400), and do not shed WAN for this requirement.
	  Y = 2050 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1700 if none of ACK 5CX1 & 5CX2 is in service
	  Z = 48L KET if DTT 48L is armed, or
	  Z = 0 if DTT 48L is not armed

CONTINGENCY	SHEDDING REQUIREMENTS
5L92	Arm DTT 2L112 RAS if • 2L293 NLY > 420 − 0.75 * 5L92 CBK, or • 2L293 SEL > 420 − 0.9 * 5L92 SEL
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.25 – 5L83 AND 5L94 AND 5L96 O.O.S. (Any Status of VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Limit: 5L91 SEL < 1300 MW if none of ACK 5CX1 and 5CX2 is in service, or
  Limit: 5L91 SEL < 1400 MW if at least one of ACK 5CX1 and 5CX2 is in service
  If alarm comes, the BC Hydro Control Centre staff should reduce the flow on 5L91 by:
  - Reducing FBC's power injection into SEL, and/or
  - Reducing SEV / KCL generation, and/or
  - Adjusting NLY PST to increase 2L112 (NLY to BDY) transfer

- 5L76 and 5L79 contingency:
  - At least two of ACK 5RX4 and 5RX7 and 5RX8 must be available.
  - If VAS-VNT loop is closed, limit BDY Gen + 2L112 NLY < 1150 MW.
  - If VAS-VNT loop is open, limit BDY Gen + 2L112 NLY < 1050 MW.

- 5L91 contingency:

  If SEL 5RX3 is available, then limit:
  (FBC injection into SEL area) < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + Y + 350
  Otherwise, limit:
  (FBC injection into SEL area) < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + Y + 350 – 1 SEV@MIN_MW

  Where:

  FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL – 2L286 SEL MW

  FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
  Y = AB to BC MW if AB to BC > 0 MW, or
  Y = 0 if AB to BC <= 0 MW

- 5L44 contingency:

  Limit: 2L64 KI2 + 0.156 * 5L44 ING + M <= 2L64_Over_Rating
  Where M is calculated as follows:
  Y = 2L112 BDY + 0.029 * 5L44 ING
  Z = 2L293 NLY + 0.024 * 5L44 ING
  If Y > NLYPST_OL_PickupMW, R1 = 0.063 * (Y - NLYPST_OL_ResetMW), Else R1 =0
  If Z > 2L293OLRAS_PickupMW, R2 = 0.080 * (Z – 2L293OLRAS_ResetMW), Else R2=0
  M = Max (R1, R2)

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements
5L83 AND 5L94 AND 5L96 O.O.S. (Any Status of VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	ACK 5CB8 in service: No generation shedding ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75) • Same as 5L75 (3P) contingency with ACK 5CB5 O.O.S. in this table
5L79	No generation shedding
5L81	No shedding required.
5L82	No shedding required.
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required.
5L81 and 5L82	Same as Table 2.24 – 5L83 AND 5L94 O.O.S.
5L76 and 5L79	Same as Table 1.25 – 5L94 AND 5L96 O.O.S.
5L87	Same as 5L83 AND 5L96 O.O.S. Table 2.20

5L44	GS1 = 3.5 * (5L81NIC + 0.3 * 5L44MDN – 5L81_Over_Rating)
	GS2 = 14.5 * (2L20CSQ + 0.22 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 37.5 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.13* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.11 * M
	
	If Y > NLYPST_OL_PickupMW,
	R1 = 0.42 * (Y - NLYPST_OL_ResetMW)
	R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	R5 = 0.05 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	R2 = 0.5 * (Z - 2L293OLRAS_ResetMW)
	R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	    • Shed at MCA/REV first, and then GMS/PCN the greatest of:
	       ➢ D1 * (GS1 + 3.5* Ra)
	       ➢ D2 * (GS2 + 14.5* Rb)
	       ➢ D3 * (GS3 + 37.5* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.65 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.1 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	    • Reduce the flow on 2L129 from ARN to VIT.
	    • Reduce SI generation and increase Peace generation

5L91
(TSA-PM must use "5L91 AND 5L96" because "5L91" signal won't be generated as long as 5L96 O.O.S.)
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17
	• Arm DTT 48L RAS if VAS-WTS loop is closed
	• Shed at KCL/ALH/SEV/WAN/BRX/WAX:
	1.02 x (5L91 SEL + 5L96 SEL) + 2L112 NLY – 1L274 POC + 1L275 NTL + 70 - Y + Z
	Y is the lesser of:
	    • 400 MW, or
	    • 1200 - BDY gen MW
	Z = 48L KET if DTT 48L RAS is armed, or Z = 0 if DTT 48L RAS is nor armed.
	
	KCL may be shed down to 0 MW. If SEL 5RX3 is available, then SEV may be shed down to 0 MW, otherwise keep a minimum of 1 SEV unit on line post shedding.
	• If TSA-PM alarms "insufficient shedding", the BC Hydro Control Centre staff must request FBC to reduce the generation of the BRD/COR/UBO/LBO/SLC, or/and the WAN unit not armed for shedding, or run one additional SEV unit as sync if SEL 5RX3 is unavailable.

5L98 (TSA-PM must treat it as "5L96 AND 5L98" contingency because "5L98" signal won't be generated as long as 5L96 O.O.S.)	Note: When both VAS-WTS and VAS-VNT loops are open, 5L98 contingency with 5L96 already out of service will black out the FBC's loads which are radially connected to VAS. When VAS-VNT loop is open and VAS-WTS loop is closed, 5L98 contingency may cause overloading on ASM T1/T2, or voltage instability in the area which is radially supplied from WTS. No shedding required.

5L92	• Arm DTT 2L112 RAS if
	    ➢ 2L293 NLY > 420 – 0.75 * 5L92 CBK, or
	    ➢ 2L293 SEL > 420 – 0.9 * 5L92 SEL

Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L98 (1P)	No shedding required.

Table 2.26 – 5L83 AND 2L112 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- 5L44 Contingency:
  Limit:
  - 2L64 KI2 + 0.157 * 5L44 ING < 2L64_Over_Rating, or

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.
- 5L91 and 5L96 contingency:
  - Limit: 5L91 SEL + 5L96 SEL + Z < 2500 MW
  - If SEL 5RX3 is available, then limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW - Z

    Otherwise, limit:
    (FBC injection into SEL area) + Y < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 – 1 SEV @ MIN.MW – 1 KCL @ MIN.MW - Z
    Where: FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL –
            60L227 KCL – 2L286 SEL MW
        FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW
        Y = AB to BC MW if AB to BC > 0, or
        Y = 0 if AB to BC <= 0
        Z = 48L KET if VAS-WTS loop is closed, or
        Z = 0 if VAS-WTS loop is open.
  - Alarm if 5L91 SEL + 5L96 SEL + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or
        If 5L91 SEL + 5L96 SEL + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW
    If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91 and 5L96.

Generation Shedding Requirements
5L83 AND 2L112 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	<u>ACK 5CB5 in service</u>: Same as Table F <u>ACK 5CB5 O.O.S.</u> (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this Table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	<u>ACK 5CB8 in service</u>: If REV Gen <= 2000 MW, shed at REV: $1.02 * ((5L75 + 5L77)\ REV + (5L91 + 5L96)\ SEL - 4215)$ MW <u>ACK 5CB8 O.O.S.</u>: (5L76 contingency will trip open 5L75) Shed at REV: • $1.02 * ((5L75 + 5L77)\ REV + (5L91 + 5L96)\ SEL - 3765)$ MW if REV Gen <= 1500 MW, or • $1.02 * ((5L75 + 5L77)\ REV + (5L91 + 5L96)\ SEL - 4010)$ MW if 1500 < REV Gen <= 2000 MW AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service in this table.
5L81	Shed at MCA/REV: $2.77 * (5L82\ NIC + 0.47 * 5L81\ NIC - 5L82\_Over\_Rating)$
5L82	Shed at MCA/REV: $2.83 * (5L81\ NIC + 0.45 * 5L82\ NIC - 5L81\_Over\_Rating)$
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required

5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable.
	
	If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	If BC is exporting to US, then
	• Reduce BC to US export.
	If BC is importing from US, then
	• Reduce (SI and FBC) generation and increase Peace generation, or/and
	• Reduce (SI and FBC) generation and increase import from US
	
	The following are the generation shedding and RAS arming requirements:
	GS is the greater of:
	• $1.13 * [(5L81 + 5L82 + 5L87)\ NIC + (2L92 + 2L93)\ SVA - 2250]$, or
	• $1.15 * [(5L81 + 5L82)\ NIC + (5L41 + 5L42 + 2L90)\ KLY - 3800]$
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: $0.93 * GS - 1.05 * AB$ to BC
	• Total armed generation shedding must be limited to 2500 - AB to BC
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
	• Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: GS
	• Total armed generation shedding must be limited to 2500 MW

5L76 and 5L79	Same as 2L112 O.O.S. Table 1.26
5L87	Same as 5L83 O.O.S. Table 1.16
5L91 & 5L96	Tables A, B, C and D are applicable to this contingency with the exception that arming DTT 2L112 RAS is not required.
5L44	$GS1 = 3.5 * (5L81\ NIC + 0.3 * 5L44\ MDN - 5L81\_Over\_Rating)$ $GS2 = 13.5 * (2L20\ CSQ + 0.22 * 5L44\ MDN - 2L20\_Over\_Rating)$ $GS3 = 35.5 * (2L51\ COK + 0.1 * 5L44\ MDN - 2L51COK\_Over\_Rating)$ • Shed at MCA/REV first, and then GMS/PCN the greatest of: ➢ $D1 * GS1$ ➢ $D2 * GS2$ ➢ $D3 * GS3$ Where: D1 = 1.0 if shedding at MCA/REV, or D1 = 1.6 if shedding at GMS/PCN, D2 = 1.0 if shedding at MCA/REV, or D2 = 1.1 if shedding at GMS/PCN, D3 = 1.0 if shedding at MCA/REV, or D3 = 1.25 if shedding at GMS/PCN. Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions: • Reduce the flow on 2L129 from ARN to VIT. • Reduce SI generation and increase Peace generation
5L91	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV: $1.10 * (5L91\ SEL + 5L96\ SEL - Y)$ Y = 1535 if SEL T1 & (T2 or/and T3) & T4 are in service, or Y = 1480 if SEL T1 or (T2 & T3) or T4 is O.O.S.

CONTINGENCY	SHEDDING REQUIREMENTS

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW and if VAS-WTS loop is closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV:
	  ➢ $1.05 * (5L91\ SEL + 5L96\ SEL + Z - Y)$
	  $Y = 1620$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	  $Y = 1500$ if none of ACK 5CX1 & 5CX2 is in service
	  $Z = 48L\ KET$ if DTT 48L is armed, or
	  $Z = 0$ if DTT 48L is not armed

5L98	If VAS-VNT loop is closed, then
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV: $1.16 * (5L91\ SEL + 5L98\ VAS - Y)$
	  $Y = 1650$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	  $Y = 1500$ if none of ACK 5CX1 & 5CX2 is in service
	Otherwise,
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV: $1.05 * (5L91\ SEL + 5L98\ VAS - Y)$
	  $Y = 1680$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	  $Y = 1540$ if none of ACK 5CX1 & 5CX2 is in service

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW and if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV: $1.05 * (5L91\ SEL + 5L96\ SEL + Z - Y)$
	  $Y = 1720$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	  $Y = 1490$ if none of ACK 5CX1 & 5CX2 is in service
	  $Z = 48L\ KET$ if DTT 48L is armed, or
	  $Z = 0$ if DTT 48L is not armed

5L92	(Note: Arming requirements for DTT 5L94, DTT 1L274 and DTT 1L275 are included in SOO 7T-17.) No DTT and shedding required.
5L94	Same as 2L112 O.O.S. Table 1.26
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.27 – 5L83 AND 2L293 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Note 3 in Section 2
- 5L44 Contingency:
  Limit: 2L64 KI2 + 0.156 * 5L44 ING + M <= 2L64_Over_Rating
  Where M is calculated as follows:
  Y = 2L112 BDY + 0.02 * 5L44 ING
  If Y > NLYPST_OL_PickupMW, M = 0.056 * (Y - NLYPST_OL_ResetMW), Else M = 0

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

- 5L91 or 5L96 or 5L98 or (5L96 AND 5L98) contingency: Limit 2L112 NLY + BDY gen MW < 1100 MW
- 5L92 contingency:
  - When 0 <= BC to AB <= 100, or 0 < AB to BC < AAL/CBK/NTL load, then
    - Limit 2L112 NLY < 370 - 2L294 NLY - 0.5 * 5L92 SEL
    - Limit 62L WTS to ESS < 270 – 0.5 * 5L92 SEL
  - When BC to AB > 100, or AB to BC > AAL/CBK/NTL load, then
    - Limit: 2L112 NLY < 370 - 2L294 NLY - 0.48 * 5L92 SEL + 0.35 * (BC-AB)
    - Limit: 62L WTS < 270 - 0.46 * 5L92 SEL + 0.34 * (BC-AB)
  - If above 62L WTS to ESS limit is exceeded, then
    - reduce BRD generation and increase WAN generation, or
    - reduce 2L112 NLY, or
    - reduce BC to AB transfer.
  (Note: the AAL/CBK/NTL load = 2L294 NLY + CBK 500 kV to 230 kV MW + 1L274 POC – 1L275 NTL MW)

Generation Shedding Requirements
5L83 AND 2L293 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Table E is applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L75 (3P)	ACK 5CB5 in service: Same as Table F ACK 5CB5 O.O.S. (5L75 contingency will trip open 5L76): • Same gen shedding as 5L76 contingency with ACK 5CB8 O.O.S. in this Table.
5L77 (3P)	Same as Table F
5L75 (1P)	Same as Table F
5L77 (1P)	Same as Table F
5L75 (1P) and 5L77 (3P)	Same as Table F
5L75 (3P) and 5L77 (1P)	Same as Table F
5L75 (3P) and 5L77 (3P)	Same as Table F
5L76	ACK 5CB8 in service: If REV Gen <= 2000 MW, shed at REV: 1.15 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4220) MW ACK 5CB8 O.O.S.: (5L76 contingency will trip open 5L75) Shed at REV: • 1.02 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 3810) MW if REV Gen <= 1500 MW, or • 1.14 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 3940) MW if 1500 < REV Gen <= 2000 MW, or • 1.14 * ((5L75 + 5L77) REV + (5L91 + 5L96) SEL – 4150) MW if REV Gen > 2000 MW AND • If REV 5CB9 is O.O.S., REV G1 and G2 must be selected for shedding.
5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service in this table.
5L81	Shed at MCA/REV: GS + 3.02 * M Where GS and M are calculated as follows: GS = Max (0, 3.02 * (5L82 NIC + 0.46 * 5L81 NIC - 5L82_Over_Rating)) Y = 2L112 NLY + 0.03 * 5L81 NIC - 0.09 * GS If Y > NLYPST_OL_PickupMW, M = 0.38 * (Y – NLYPST_OL_ResetMW), Else M = 0
5L82	Shed at MCA/REV: GS + 3.09 * M Where GS and M are calculated as follows: GS = Max (0, 3.09 * (5L81 NIC + 0.44 * 5L82 NIC - 5L81_Over_Rating)) Y = 2L112 NLY + 0.03 * 5L82 NIC - 0.09 * GS If Y > NLYPST_OL_PickupMW, M = 0.37 * (Y – NLYPST_OL_ResetMW), Else M = 0
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required

CONTINGENCY	SHEDDING REQUIREMENTS

5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable.
	
	If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	    If BC is exporting to US, then reduce BC to US export.
	    If BC is importing from US, then
	        • reduce (SI and FBC) generation and increase Peace generation, or/and
	        • reduce (SI and FBC) generation and increase import from US
	
	The following are the generation shedding and RAS arming requirements:
	
	If 2L112 NLY < 200 MW, then GS is the greater of:
	• 1.13 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA + 2L112 NLY – 2250], or
	• 1.15 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY + 2L112 NLY – 3800]
	
	If 2L112 NLY >= 200, then GS is the greater of:
	• 1.18 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA – 2250], or
	• 1.20 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY – 3800]
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• If 2L112 NLY < 200 MW , then
	    Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.05 * AB to BC
	    Otherwise
	    Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.10 * AB to BC
	• Total armed generation shedding must be limited to 2500 - AB to BC
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
	• Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: GS
	• Total armed generation shedding must be limited to 2500 MW
	
	Arm DTT 2L112 RAS, If
	• 2L112 NLY < 200 AND GS > 0

5L76 and 5L79	Same as 2L293 O.O.S. Table 1.27
5L87	Same as 5L83 O.O.S. Table 1.16
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	GS1 = 3.5 * (5L81NIC + 0.3 * 5L44MDN – 5L81_Over_Rating) GS2 = 14.5 * (2L20CSQ + 0.22 * 5L44 MDN - 2L20_Over_Rating) GS3 = 36.5 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_Rating) Shed at MCA/REV first, and then GMS/PCN the greatest of: D1 * GS1 D2 * GS2 D3 * GS3 Where: D1 = 1.0 if shedding at MCA/REV, or D1 = 1.65 if shedding at GMS/PCN, D2 = 1.0 if shedding at MCA/REV, or D2 = 1.1 if shedding at GMS/PCN, D3 = 1.0 if shedding at MCA/REV, or D3 = 1.25 if shedding at GMS/PCN. Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions: Reduce the flow on 2L129 from ARN to VIT. Reduce SI generation and increase Peace generation.
5L91	• Shed at KCL/ALH/BRX/WAX/SEV (select SEV for shed last): 1.10 * (5L91 SEL + 5L96 SEL – 1580) and • Shed at WAN: 2.30 * (2L112 NLY + 0.11 * 5L91 SEL – 400 – 0.18 * (armed KCL/ALH/BRX/WAX/SEV shedding amount for the contingency))

5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed.
	• Shed at WAN the greater:
	  ➢ 2.05 * (2L112 NLY + 0.17 * (5L96 SEL + Z) – 400)
	  ➢ 2.05 * (2L112 NLY + 0.17 * (5L96 SEL + Z) + BDY GEN – 1180)
	  GS = Armed WAN shedding amount for this contingency.
	• Shed at KCL/ALH/BRX/WAX, then SEV the greatest of:
	  ➢ 1.20 * (5L91 SEL + 5L96 SEL + Z – Y – 0.48 * GS)
	  ➢ 3.74 * (2L112 NLY + 0.17 * (5L96 SEL + Z) – 0.49 * GS - 400)
	  ➢ 3.74 * (2L112 NLY + 0.17 * (5L96 SEL + Z) + BDY Gen – 0.49 * GS – 1180)
	  Y = 1990 if at least one of ACK 5CX1 & 5CX2 is in service, or
	  Y = 1830 if none of ACK 5CX1 & 5CX2 is in service
	  Z = 48L KET if DTT 48L is armed, or
	  Z = 0 if DTT 48L is not armed

CONTINGENCY	SHEDDING REQUIREMENTS

5L98	If VAS-VNT loop is closed, then
	• Shed at WAN:
	    2.19 * (2L112 NLY + 0.13 * 5L98 VAS – 400) GS = Armed WAN shedding amount for this contingency.
	• Shed at KCL/ALH/BRX/WAX, then SEV the greater of:
	    • 1.17 * (5L91 SEL + 5L98 VAS – Y – 0.50 * GS)
	    • 4.32 * (2L112 NLY + 0.13 * 5L98 VAS – 0.45 * GS – 400)
	
	    Y = 1790 if at least one of ACK 5CX1 & 5CX2 is in service, or
	    Y = 1600 if none of ACK 5CX1 & 5CX2 is in service
	
	If VAS-VNT loop is open, then
	• Shed at WAN: 2.16 * (2L112 NLY + 0.16 * 5L98 VAS – 400)
	    GS = Armed WAN shedding amount for this contingency.
	• Shed at KCL/ALH/BRX/WAX, then SEV the greater of:
	    • 1.14 * (5L91 SEL + 5L98 VAS – Y – 0.51 * GS)
	    • 4.12 * (2L112 NLY + 0.16 * 5L98 VAS – 0.46 * GS – 400)
	    Y = 1790 if at least one of ACK 5CX1 & 5CX2 is in service, or
	    Y = 1590 if none of ACK 5CX1 & 5CX2 is in service

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed.
	• Shed at WAN the greater of:
	    ➢ 2.12 * (2L112 NLY + 0.20 * (5L96 SEL + Z) – 400)
	    ➢ 2.12 * (2L112 NLY + 0.20 * (5L96 SEL + Z) + BDY GEN – 1200)
	    GS = Armed WAN shedding amount for this contingency.
	• Shed at KCL/ALH/BRX/WAX, then SEV:
	    ➢ 1.20 * (5L91 SEL + 5L96 SEL + Z – Y – 0.48 * GS)
	    ➢ 3.74 * (2L112 NLY + 0.20 * (5L96 SEL + Z) – 0.44 * GS - 400)
	    ➢ 3.74 * (2L112 NLY + 0.20 * (5L96 SEL + Z) + BDY Gen – 0.44 * GS – 1200)
	    Y = 1960 if at least one of ACK 5CX1 & 5CX2 is in service, or
	    Y = 1800 if none of ACK 5CX1 & 5CX2 is in service
	    Z = 48L KET if DTT 48L is armed, or
	    Z = 0 if DTT 48L is not armed

5L92	(Note: Arming requirements for DTT 5L94, DTT 1L274 and DTT 1L275 are included in SOO 7T-17.) • If 0 <= BC to AB <= 100, or 0 < AB to BC <= AAL/CBK/NTL load, then Shed at WAN: 2.3 * (62L ESS - 0.43 * 5L92 SEL – 270) • If BC to AB > 100, then shed at WAN: 2.3 * (62L ESS – 0.42 * 5L92 SEL + 0.3 * (BC-AB) - 270) • If AB to BC > AAL/CBK/NTL load, then shed at WAN: 2.3 * (62L ESS - 0.31 * 5L92 SEL + 0.15 * (BC-AB) – 270) (Note: the AAL/CBK/NTL load = 2L294 NLY +CBK 500kV to 230 kV MW + 1L274 POC – 1L275 NTL MW)
5L94	Same as 2L293 O.O.S. Table 1.27
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.28 - 5L83 AND 2L294 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2

Generation Shedding Requirements
5L83 AND 2L294 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table A
5L79	Same as Table A
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required.
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L76 and 5L79	Same as 5L83 AND 2L293 O.O.S. Table 2.27
5L87	Same as 5L83 O.O.S. Table 1.16
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as 5L83 O.O.S. Table 1.16
5L91	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ $1.23 * (5L91\ SEL + 5L96\ SEL - Y)$, or ➢ $3.55 * (2L112\ NLY + 0.18 * 5L91\ SEL - 400)$, or ➢ $4.25 * (2L293\ SEL + 0.19 * 5L91\ SEL - 400)$, and do not shed WAN for this requirement. $Y = 1790$ if all SEL T1 & (T2 or/and T3) & T4 are in service, or $Y = 1730$ if SEL T1 or (T2 & T3) or T4 is O.O.S.
5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed. • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or ➢ $2.40 * (2L112\ NLY + 0.24 * (5L96\ SEL + Z) - 400)$, or ➢ $2.40 * (2L112\ NLY + BDY\ Gen + 0.24 * (5L96\ SEL + Z) - 1150)$, or ➢ $2.77 * (2L293\ SEL + 0.19 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement. $Y = 2140$ if at least one of ACK 5CX1 & 5CX2 is in service, or $Y = 1830$ if none of ACK 5CX1 & 5CX2 is in service $Z = 48L\ KET$ if DTT 48L is armed, or $Z = 0$ if DTT 48L is not armed
5L98	If VAS-VNT loop is closed, then • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ $1.17 * (5L91\ SEL + 5L98\ VAS - Y)$, or ➢ $3.12 * (2L112\ NLY + 0.17 * 5L98\ VAS - 400)$, or ➢ $4.35 * (2L293\ SEL + 0.15 * 5L98\ VAS - 400)$, and do not shed WAN for this requirement. $Y = 1960$ if at least one of ACK 5CX1 & 5CX2 is in service, or $Y = 1840$ if none of ACK 5CX1 & 5CX2 is in service If VAS-VNT loop is open, then • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ $1.14 * (5L91\ SEL + 5L98\ VAS - Y)$, or ➢ $3.03 * (2L112\ NLY + 0.2 * 5L98\ VAS - 400)$, or ➢ $4.20 * (2L293\ SEL + 0.18 * 5L98\ VAS - 400)$, and do not shed WAN for this requirement. $Y = 2060$ if at least one of ACK 5CX1 & 5CX2 is in service, or $Y = 1880$ if none of ACK 5CX1 & 5CX2 is in service
5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND if both VAS-WTS and VAS-VNT loops are closed. • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or ➢ $2.75 * (2L112\ NLY + 0.27 * (5L96\ SEL + Z) - 400)$, or ➢ $2.75 * (2L112\ NLY + BDY\ Gen + 0.27 * (5L96\ SEL + Z) - 1220)$, or ➢ $2.67 * (2L293\ SEL + 0.21 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement. $Y = 2110$ if at least one of ACK 5CX1 & 5CX2 is in service, or $Y = 1870$ if none of ACK 5CX1 & 5CX2 is in service $Z = 48L\ KET$ if DTT 48L is armed, or $Z = 0$ if DTT 48L is not armed
5L92	• If (BC to US + 5L92 SEL) > 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: 5L92 SEL MW • If 700 MW < (BC to US + 5L92 SEL) <= 2400 MW, then shed at KCL/SEV/ALH/WAN/BRX/REV/WAX: 5L92 SEL – 400 MW • If generation shedding is armed, keep a minimum of 2 REV, 2 SEV and 1 equivalent SEV units on-line post shedding. AND • Arm DTT 2L112 RAS if ➢ $2L112\ BDY + 0.3 * 5L92\ CBK > 400$ MW, or ➢ $2L293\ NLY + 0.3 * 5L92\ CBK > 400$ MW, or ➢ $2L112\ NLY + 0.3 * 5L92\ SEL - 0.3 * (\text{armed KCL/SEV/ALH/WAN/BRX/REV/WAX shedding amount for 5L92 contingency}) > 400$ MW, or ➢ $2L293\ SEL + 0.3 * 5L92\ SEL - 0.3 * (\text{armed KCL/SEV/ALH/WAN/BRX/REV/WAX shedding amount for 5L92 contingency}) > 400$ MW
5L94	Same as 2L294 O.O.S. Table 1.28
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.29 – 5L83 AND 2L277 O.O.S (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
5L83 AND 2L277 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table A
5L79	Same as Table A
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same 5L83 O.O.S. Table 1.16
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required.
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L76 and 5L79	Same as 5L83 AND 2L293 O.O.S. Table 2.27
5L87	Same as 5L83 O.O.S. Table 1.16
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as system normal Table 1.1
5L91	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ $1.10 * (5L91\ SEL + 5L96\ SEL - 1680)$, or ➢ $3.70 * (2L112\ NLY + 0.18 * 5L91\ SEL - 400)$, or ➢ $3.50 * (2L293\ SEL + 0.17 * 5L91\ SEL - 400)$.
5L96	• Arm DTT 48L if 5L96 SEL > 800 MW AND if VAS-WTS loop is closed • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or ➢ $2.54 * (2L112\ NLY + 0.23 * (5L96\ SEL + Z) - 400)$, or ➢ $2.54 * (2L112\ NLY + BDY\ Gen + 0.23 * (5L96\ SEL + Z) - 1120)$, or ➢ $2.57 * (2L293\ SEL + 0.21 * (5L96\ SEL + Z) - 400)$. $Y = 2040$ if at least one of ACK 5CX1 & 5CX2 is in service, or $Y = 1820$ if none of ACK 5CX1 & 5CX2 is in service $Z = 48L\ KET$ if DTT 48L is armed, or $Z = 0$ if DTT 48L is not armed
5L98	If VAS-VNT loop is closed, then • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ $1.17 * (5L91\ SEL + 5L98\ VAS - Y)$, or ➢ $2.94 * (2L112\ NLY + 0.17 * 5L98\ VAS - 400)$, or ➢ $3.06 * (2L293\ SEL + 0.16 * 5L98\ VAS - 400)$. $Y = 1810$ if at least one of ACK 5CX1 & 5CX2 is in service, or $Y = 1710$ if none of ACK 5CX1 & 5CX2 is in service. Otherwise, • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ $1.15 * (5L91\ SEL + 5L98\ VAS - Y)$, or ➢ $2.85 * (2L112\ NLY + 0.20 * 5L98\ VAS - 400)$, or ➢ $2.98 * (2L293\ SEL + 0.18 * 5L98\ VAS - 400)$. $Y = 1910$ if at least one of ACK 5CX1 & 5CX2 is in service, or $Y = 1740$ if none of ACK 5CX1 & 5CX2 is in service
5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW AND VAS-VNT loop closed • Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: ➢ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or ➢ $2.54 * (2L112\ NLY + 0.27 * (5L96\ SEL + Z) - 400)$, or ➢ $2.54 * (2L112\ NLY + BDY\ Gen + 0.27 * (5L96\ SEL + Z) - 1140)$, or ➢ $2.46 * (2L293\ SEL + 0.25 * (5L96\ SEL + Z) - 400)$. $Y = 2010$ if at least one of ACK 5CX1 & 5CX2 is in service, or $Y = 1800$ if none of ACK 5CX1 & 5CX2 is in service $Z = 48L\ KET$ if DTT 48L is armed, or $Z = 0$ if DTT 48L is not armed
5L92	(Note: Arming requirements for DTT 5L94, DTT 1L274 and DTT 1L275 are included in SOO 7T-17.) Arm DTT 2L112 RAS if ➢ $(0 < AB\ to\ BC <= 100\ MW)$ **AND** $(2L293\ NLY + 0.75 * 5L92\ CBK > 400\ MW)$, or ➢ $(AB\ to\ BC > 100\ MW)$ **AND** $(2L293\ NLY + 5L92\ CBK - 0.68 * (AB\ to\ BC) > 400\ MW)$, or ➢ $(0 <= BC\ to\ AB <= 100\ MW)$ **AND** $(2L293\ SEL + 0.95 * 5L92\ SEL - 0.2 * (BC\ to\ AB) > 400\ MW)$, or ➢ $(BC\ to\ AB > 100\ MW)$ **AND** $(2L293\ SEL + 5L92\ SEL - 0.7 * (BC\ to\ AB) - 0.3 * (armed\ KCL/SEV/ALH/WAN/BRX/REV/WAX\ shedding\ amount\ for\ 5L94\ contingency) > 400\ MW)$
5L94	Same as Table A
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.30 – 5L83 AND 5L40 O.O.S., or 5L83 AND 5L41 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- Limit: 5L82 NIC MW <= 5L82_Norm_Rating

  If TSA-PM alarms "VIOLATION_5L82_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to reduce the flow on 5L82 from NIC within its continuous rating:
    - Reduce SI generation and increase LM / VI / Peace generation, or
    - Reduce AB- BC transfer or,
    - Reduce ING to CUS transfer
- 5L44 contingency:

  Limit:
    - 2L64 KI2 + 0.178 * 5L44 ING + M1 <= 2L64_Over_Rating, or
    - - 2L56 MAN + 0.121 * 5L44 ING + M2 <= 2L56_Over_Rating, or
    - 2L27 ING + 0.197 * 5L44 ING + M3 <= 2L27_Over_Rating

  Where M1, M2 and M3 are calculated as follows:

  $Y = 2L112\ BDY + 0.043 * 5L44\ ING$

  $Z = 2L293\ NLY + 0.036 * 5L44\ ING$

  If Y > NLYPST_OL_PickupMW:
    $R1 = 0.083 * (Y - NLYPST\_OL\_ResetMW)$
    $R2 = 0.057 * (Y - NLYPST\_OL\_ResetMW)$
    $R3 = 0.097 * (Y - NLYPST\_OL\_ResetMW)$

  Else:
    R1 = 0
    R2 = 0
    R3 = 0

  If Z > 2L293OLRAS_PickupMW:
    $R4 = 0.103 * (Z - 2L293OLRAS\_ResetMW)$
    $R5 = 0.070 * (Z - 2L293OLRAS\_ResetMW)$
    $R6 = 0.120 * (Z - 2L293OLRAS\_ResetMW)$

  Else:
    R4 = 0
    R5 = 0
    R6 = 0

  M1 = Max (R1, R4)
  M2 = Max (R2, R5)
  M3 = Max (R3, R6)

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG" and/or "VIOLATION_2L56 MAN OVER RATING_5L44CTG" and/or "VIOLATION_2L27 ING OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
    - Increase flow on 2L129 ARN, or
    - Increase LM generation, or
    - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements

5L83 AND 5L40 O.O.S. or 5L83 AND 5L41 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS

5L81	GS1 = Max (0, 4.44 * (5L42 KLY + 0.31 * 5L81 NIC - 5L42_Over_Rating))
	GS2 = Max (0, 2.62 * (5L82 NIC + 0.55 * 5L81 NIC - 5L82_Over_Rating))
	
	If GS1 >= GS2,
	    Y = 2L112 NLY + 0.07 * 5L81 NIC - 0.13 * GS1
	    Z = -2L293 NLY + 0.06 * 5L81 NIC - 0.12 * GS1
	    If Y > NLYPST_OL_PickupMW, M1 = 0.29 * (Y – NLYPST_OL_ResetMW), Else M1 = 0
	    If Z > 2L293OLRAS_PickupMW, M2 = 0.35 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0
	    M = Max (M1, M2)
	
	    Gen shed at MCA/REV : GS1 + 4.44 * M
	
	If GS2 > GS1,
	    Y= 2L112 NLY + 0.07 * 5L81 NIC-0.13 * GS2
	    Z = -2L293 NLY + 0.06 * 5L81 NIC-0.12 * GS2
	    If Y > NLYPST_OL_PickupMW, R1 = 0.49 * (Y – NLYPST_OL_ResetMW), Else R1 = 0
	    If Z > 2L293OLRAS_PickupMW, R2 = 0.60 * (Z – 2L293OLRAS_ResetMW), Else R2 = 0
	    R = Max (R1, R2)
	
	    Gen shed at MCA/REV: GS2 + 2.62 * R

5L82	GS1 = Max (0, 4.39 * (5L42 KLY + 0.36 * 5L82 NIC - 5L42_Over_Rating))
	GS2 = Max (0, 2.66 * (5L81 NIC + 0.55 * 5L82 NIC - 5L81_Over_Rating))
	
	If GS1 >= GS2,
	    Y = 2L112 NLY + 0.06 * 5L82 NIC - 0.13 * GS1
	    Z = -2L293 NLY + 0.05 * 5L82 NIC - 0.12 * GS1
	    If Y > NLYPST_OL_PickupMW, M1 = 0.30 * (Y – NLYPST_OL_ResetMW), Else M1 = 0
	    If Z > 2L293OLRAS_PickupMW, M2 = 0.36 * (Z – 2L293OLRAS_ResetMW), Else M2 = 0
	    M = Max (M1, M2)
	
	    Gen shed at MCA/REV: GS1 + 4.39 * M
	
	If GS2 > GS1,
	    Y = 2L112 NLY + 0.06 * 5L82 NIC - 0.13 * GS2
	    Z = -2L293 NLY + 0.05 * 5L82 NIC - 0.12 * GS2
	    If Y > NLYPST_OL_PickupMW, R1 = 0.48 * (Y – NLYPST_OL_ResetMW), Else R1 = 0
	    If Z > 2L293OLRAS_PickupMW, R2 = 0.59 * (Z – 2L293OLRAS_ResetMW), Else R2 = 0
	    R = Max (R1, R2)
	
	    Gen shed at MCA/REV: GS2 + 2.66 * R

5L87	Shed at MCA/REV: 1.13 * ((5L81 + 5L82 + 5L87) NIC - 4400) MW

5L44	GS1 = 3.5 * (5L81NIC + 0.41 * 5L44MDN – 5L81_ Over_Rating)
	GS2 = 15.5 * (2L20CSQ + 0.25 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 40.5 * (2L51COK + 0.12 * 5L44MDN - 2L51COK_ Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.06 * 5L44 MDN – 0.16* M
	Z = 2L293 SEL + 0.06 * 5L44 MDN – 0.14* M
	
	If Y > NLYPST_OL_PickupMW,
	    R1 = 0.48 * (Y - NLYPST_OL_ResetMW)
	    R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	    R5 = 0.05 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	    R2 = 0.58 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	    R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	    ➢ D1 * (GS1 + 3.5* Ra)
	    ➢ D2 * (GS2 + 15.5* Rb)
	    ➢ D3 * (GS3 + 40.5* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.35 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.0 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.1 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding.
	
	If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	    If BC is exporting to US, then
	        • reduce AB to BC transfer if AB to BC transfer > 500 MW, or/and
	        • reduce BC to US export.
	    If BC is importing from US, then
	        • reduce AB to BC transfer if AB to BC transfer > 475 MW, or/and
	        • reduce (SI AND FBC) generation and increase Peace generation, or/and
	        • reduce (SI AND FBC) generation and increase import from US
	
	The following are the generation shedding and RAS arming requirements:
	
	If 2L112 NLY < 200 MW OR 0.14 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then GS is the greater of:
	• 1.13 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA + 2L112 NLY – 2250], or
	• 1.15 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY + 2L112 NLY – 2150]
	
	If 2L112 NLY >= 200 AND 0.14 * (5L81 + 5L82) NIC + 2L293 SEL <= 420, then GS is the greater of:
	• 1.18 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA – 2250], or
	• 1.20 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY – 2150]
	
	If AB to BC >= 500 MW AND GS >= 1500 MW, then
	• Arm DTT 5L94, and
	• Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	• If 2L112 NLY < 200 MW OR 0.14 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then
	      Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.05 * AB to BC
	      Otherwise
	      Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.10 * AB to BC
	• Total armed generation shedding must be limited to 2500 - AB to BC
	
	If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
	• Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: GS
	• Total armed generation shedding must be limited to 2500 MW
	
	Arm DTT 2L112 RAS, If
	• 2L112 NLY < 200 AND GS > 0 , or
	• 0.14 * (5L81 + 5L82) NIC + 2L293 SEL > 420

Table 2.31 – 5L83 AND 5L42 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- Limit: 5L82 NIC MW <= 5L82_Norm_Rating

  If TSA-PM alarms "VIOLATION_5L82_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to reduce the flow on 5L82 from NIC within its continuous rating:
    - Reduce SI generation and increase LM / VI / Peace generation, or,
    - Reduce AB to BC transfer, or
    - Reduce ING to CUS transfer.
- 5L44 contingency:
    - Limit 2L129 ARN to the lesser of:
        - 590 MW, or
        - 2L129_0.5hr_Rating – 0.075 * 5L44 ING MW

      If TSA-PM alarms "VIOLATION_2L129 ARN MW LIMIT_5L44CTG", the BC Hydro Control Centre staff shall take the following actions to bring the flow on 2L129 ARN within the limit:
        - Increase VI generation, or
        - Reduce CUS to ING flow
    - Limit:
        - 2L64 KI2 + 0.176 * 5L44 ING + M1 <= 2L64_Over_Rating, or
        - - 2L56 MAN + 0.120 * 5L44 ING + M2 <= 2L56_Over_Rating, or
        - 2L27 ING + 0.196 * 5L44 ING + M3 <= 2L27_Over_Rating

      Where M1, M2 and M3 are calculated as follows:
        Y = 2L112 BDY + 0.029 * 5L44 ING
        Z = 2L293 NLY + 0.025 * 5L44 ING

      If Y > NLYPST_OL_PickupMW:
        R1 = 0.057 * (Y – NLYPST_OL_ResetMW)
        R2 = 0.039 * (Y - NLYPST_OL_ResetMW)
        R3 = 0.064 * (Y - NLYPST_OL_ResetMW)
      Else:
        R1 = 0
        R2 = 0
        R3 = 0

      If Z > 2L293OLRAS_PickupMW:
        R4 = 0.071 * (Z – 2L293OLRAS_ResetMW)
        R5 = 0.048 * (Z – 2L293OLRAS_ResetMW)
        R6 = 0.079 * (Z – 2L293OLRAS_ResetMW)
      Else:
        R4 = 0
        R5 = 0
        R6 = 0

      M1 = Max (R1, R4)
      M2 = Max (R2, R5)
      M3 = Max (R3, R6)

      If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG" and/or "VIOLATION_2L56 MAN OVER RATING_5L44CTG" and/or "VIOLATION_2L27 ING OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
        - Increase flow on 2L129 ARN, or
        - Increase LM generation, or
        - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements
5L83 AND 5L42 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS

5L81	GS1 = Max (0, 4.95 * (5L41 KLY + 0.30 * 5L81 NIC - 5L41_Over_Rating))
	GS2 = Max (0, 2.59 * (5L82 NIC + 0.55 * 5L81 NIC - 5L82_Over_Rating))
	
	If GS1 >= GS2,
	
	    Y = 2L112 NLY + 0.07 * 5L81 NIC - 0.13 * GS1
	    Z = -2L293 NLY + 0.06 * 5L81 NIC - 0.12 * GS1
	    If Y > NLYPST_OL_PickupMW A, M1 = 0.27 * (Y - NLYPST_OL_ResetMW), Else M1 = 0
	    If Z > 2L293OLRAS_PickupMW, M2 = 0.32 * (Z - 2L293OLRAS_ResetMW), Else M2 = 0
	    M = Max (M1, M2)
	
	    Gen shed at MCA/REV: GS1 + 4.95 * M
	
	If GS2 > GS1,
	    Y = 2L112 NLY + 0.07 * 5L81 NIC - 0.13 * GS2
	    Z = -2L293 NLY + 0.06 * 5L81 NIC - 0.12 * GS2
	    If Y > NLYPST_OL_PickupMW, R1 = 0.50 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
	    If Z > 2L293OLRAS_PickupMW, R2 = 0.61 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
	    R = Max (R1, R2)
	
	    Gen shed at MCA/REV: GS2 + 2.59 * R

5L82	GS1 = Max (0, 5.12 * (5L41 KLY + 0.29 * 5L82 NIC - 5L41_Over_Rating))
	GS2 = Max (0, 2.59 * (5L81 NIC + 0.55 * 5L82 NIC - 5L81_Over_Rating))
	
	If GS1>= GS2,
	    Y = 2L112 NLY + 0.06 * 5L82 NIC - 0.13 * GS1
	    Z = -2L293 NLY + 0.05 * 5L82 NIC- 0.12 * GS1
	    If Y > NLYPST_OL_PickupMW, M1 = 0.26 * (Y - NLYPST_OL_ResetMW), Else M1 = 0
	    If Z > 2L293OLRAS_PickupMW, M2 = 0.32 * (Z - 2L293OLRAS_ResetMW), Else M2 = 0
	    M = Max (M1, M2)

	Gen shed at MCA/REV: GS1 + 5.12 * M
	
	If GS2 > GS1,
	    Y = 2L112 NLY + 0.06 * 5L82 NIC - 0.13 * GS2
	    Z = -2L293 NLY + 0.05 * 5L82 NIC - 0.12 * GS2
	    If Y > NLYPST_OL_PickupMW, R1 = 0.50 * (Y2 - NLYPST_OL_ResetMW), Else R1 = 0
	    If Z > 2L293OLRAS_PickupMW, R2 = 0.61* (Z2 - 2L293OLRAS_ResetMW), Else R2 = 0
	    R = Max (R1, R2)
	
	Gen shed at MCA/REV: GS2 + 2.59 * R

5L87	Shed at MCA/REV: 1.1 * ((5L81 + 5L82 + 5L87) NIC - 4600) MW
5L44	No shedding required

5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable.
	
	If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	    If BC is exporting to US, then reduce BC to US export.
	    If BC is importing from US, then
	        • reduce (SI AND FBC) generation and increase Peace generation, or
	        • reduce (SI AND FBC) generation and increase import from US
	The following are the generation shedding and RAS arming requirements:
	If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then GS is the greater of:
	    • 1.13 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA + 2L112 NLY - 2250], or
	    • 1.15 * [(5L81 + 5L82) NIC + (5L41 + 2L90) KLY + 2L112 NLY - A]
	If 2L112 NLY >= 200 AND 0.10 * (5L81 + 5L82) NIC + 2L293 SEL <= 420, then GS is the greater of:
	    • 1.18 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA - 2250], or
	    • 1.20 * [(5L81 + 5L82) NIC + (5L41 + 2L90) KLY - A]
	
	The constant A in the above gen-shedding formulas is determined by status of 2L90:
	    • If 2L90 is in service, then A = 1880
	    • IF 2L90 is open, then A = 2165
	
	If AB to BC >= 450 MW AND GS >= 1500 MW, then
	    • Arm DTT 5L94, and
	    • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	    • If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then
	        Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.05 * AB to BC
	        Otherwise
	        Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.10 * AB to BC
	    • Total armed generation shedding must be limited to 2500 - AB to BC
	
	If AB to BC < 450 MW or [AB to BC >= 450 MW AND GS < 1500], then
	    • Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: GS
	    • Total armed generation shedding must be limited to 2500
	Arm DTT 2L112 RAS, If
	    • 2L112 NLY < 200 AND GS > 0 , or
	    • 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420

Table 2.32 – 5L83 AND 5L44 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- Limit: 5L81 NIC MW <= 5L81_Norm_Rating
  If TSA-PM alarms "VIOLATION_5L81_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to reduce the flow on 5L81 from NIC within its continuous rating:
  - Reduce 2L129 flow, or
  - Increase LM/VI/Peace generation and reduce SI generation, or
  - Reduce AB to BC transfer, or
  - Reduce BC export to US.

- 5L82 contingency:

  ► Limit:
  - 2L64 KI2 + 0.15 * 5L82 NIC <= 2L64_Over_Rating, or

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L82CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

  ► Limit: LM+VI Load Supplied from ILM+US <= 5300 MW
  Where: LM+VI Load Supplied from ILM+US = (5L41+5L42+2L90) KLY + (5L81 + 5L82) NIC - (5L51 + 5L52) ING
  If TSA-PM alarms "VIOLATION_LM+VI LOAD SUPPLIED FROM ILM+US > 5300MW", the BC Hydro Control Centre staff shall increase LM / VI / BR generation to meet the requirement.
  ► If 4900 MW < LM+VI Load Supplied from ILM+US <= 5300 MW, at least 3 BSY SC must be on-line.

  2L50 contingency:
  ► Limit:
  - 2L51 COK + 0.40 * 2L50 BSY <= 2L51COK_Over_Rating
  If TSA-PM alarms "VIOLATION_2L51 COK OVER RATING_2L50CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 ARN, or
  - Increase generation at SEE, RUS and SFL, or
  - Reduce generation at BR and North Shore Area, or
  - Reduce export to US on 5L51 and 5L52.

- 2L11 contingency:

  ► Limit: 2L51 COK + 0.45 * 2L11 BSY <= 2L51COK_Over_Rating
  If TSA-PM alarms "VIOLATION_2L51 COK OVER RATING_2L11CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 ARN, or
  - Increase generation at SEE, RUS and SFL, or
  - Reduce generation at BR and North Shore Area, or
  - Reduce export to US on 5L51 and 5L52.

- 2L49 contingency:

  ► Limit: 2L51 COK + 0.50 * 2L49 MDN <= 2L51COK_Over_Rating
  If TSA-PM alarms "VIOLATION_2L51 COK OVER RATING_2L49CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 ARN, or
  - Increase generation at SEE, RUS and SFL, or
  - Reduce generation at BR and North Shore Area, or
  - Reduce export to US on 5L51 and 5L52.

- 2L51 contingency:

  ► Limit: 2L50 BSY + 0.25 * 2L51 COK <= 2L50_Over_Rating
  If TSA-PM alarms "VIOLATION_2L50 OVER RATING_2L51CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Reduce flow on 2L129 ARN, or
  - Increase generation at SEE, RUS and SFL, or
  - Reduce generation at BR and North Shore Area, or
  - Reduce export to US on 5L51 and 5L52.

Generation Shedding Requirements
5L83 AND 5L44 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Gen-shedding at REV/MCA the greatest of: • 11.6 * (2L22 MDN + 0.14 * 5L81 NIC + 5 - 2L22_Over_Rating), or • 13.5 * (2L64 SPG + 0.13 * 5L81 NIC + 5 - 2L64_Over_Rating), or • 19.2 * (2L51 COK + 0.09 * 5L81 NIC + 5 - 2L51COK_Over_Rating) If TSA-PM alarms "<5L81CTG_5L44O.O.S.>: INSUFFICIENT SHEDDING AT <REV/MCA>", then the BC Hydro Control Centre staff shall take the following actions to meet the requirement: • Reduce 2L129 flow • Increase VI generation • Increase SEE, RUS, and SFL generation.
5L82	Shed at MCA/REV: • 3.23 * (5L87 NIC + 0.58* 5L82 NIC – 5L87_Over_Rating) MW If generation shedding is required, keep a minimum of 2 MCA and 2 REV units on-line post-shedding. If TSA-PM alarms "<5L82CTG_5L44O.O.S.>: MIN# UNITS ONLINE VIOLATION", or "VIOLATION_5L87_NORM_RATING" post-contingency, the BC Hydro Control Centre staff shall take the following actions to meet the requirement: • Reduce MCA or REV or SIE generation, or • Reduce flow on 2L112 from BDY to NLY, or • Reduce import from Alberta.
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L87	Same as 5L83 O.O.S. Table 1.16

Table 2.33 – 5L83 AND 5L45 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
5L83 AND 5L45 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS

5L81	Gen shed at MCA/REV: GS + 2.92 * R
	Where GS and R are calculated as follows:
	    GS = Max (0, 2.92 * (5L82 NIC + 0.50 * 5L81 NIC - 5L82_Over_Rating))
	    Y = 2L112 NLY + 0.06 * 5L81 NIC - 0.17 * GS
	    Z = -2L293 NLY + 0.05 * 5L81 NIC - 0.15 * GS
	    If Y > NLYPST_OL_PickupMW, R1 = 0.41 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
	    If Z > 2L293OLRAS_PickupMW, R2 = 0.50 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
	    R = Max (R1, R2)

5L82	Gen shed at REV/MCA: GS + 3.06 * R
	Where GS and R are calculated as follows:
	    GS = Max (0, 3.06 * (5L81 NIC + 0.50 * 5L82 NIC - 5L81_Over_Rating))
	    Y= 2L112 NLY + 0.06 * 5L82 NIC - 0.15 * GS
	    Z = -2L293 NLY + 0.05 * 5L82 NIC - 0.14 * GS
	    If Y > NLYPST_OL_PickupMW, R1 = 0.41 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
	    If Z > 2L293OLRAS_PickupMW, R2 = 0.50 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
	    R = Max (R1, R2)

5L87	Shed at MCA/REV: 1.1 * ((5L81 + 5L82 + 5L87) NIC - 4300) MW
5L44	No shedding required

5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable.
	
	If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	    If BC is exporting to US, then reduce BC to US export.
	    If BC is importing from US, then
	        • reduce (SI and FBC) generation and increase Peace generation, or/and
	        • reduce (SI and FBC) generation and increase import from US
	
	The following are the generation shedding and RAS arming requirements:
	
	If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then GS is the greater of:
	    • 1.13 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA + 2L112 NLY – 2250], or
	    • 1.15 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY + 2L112 NLY – 3200]
	
	If 2L112 NLY >= 200 AND 0.10 * (5L81 + 5L82) NIC + 2L293 SEL <= 420, then GS is the greater of:
	    • 1.18 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA – 2250], or
	    • 1.20 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY – 3200]
	
	If AB to BC >= 400 MW AND GS >= 1500 MW, then
	        • Arm DTT 5L94, and
	        • Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
	        • If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then
	            Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.05 * AB to BC
	            Otherwise
	            Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.10 * AB to BC
	        • Total armed generation shedding must be limited to: 2500 - AB to BC
	
	If AB to BC < 400 MW or [AB to BC >= 400 MW AND GS < 1500], then
	        • Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: GS
	        • Total armed generation shedding must be limited to 2500
	Arm DTT 2L112 RAS, If
	        • 2L112 NLY < 200 AND GS > 0 , or
	        • 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420

Table 2.34 – 5L83 AND GUI 5CX1 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- 5L44 Contingency:
  Limit: 2L64 KI2 + 0.16 * 5L44 ING + M <= 2L64_Over_Rating
  Where M is calculated as follows:
  Y = 2L112 BDY + 0.034 * 5L44 ING
  Z = 2L293 NLY + 0.028 * 5L44 ING
  If Y > NLYPST_OL_PickupMW, R1 = 0.074 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
  If Z > 2L293OLRAS_PickupMW, R2 = 0.091 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
  M = Max (R1, R2)

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements
  5L83 AND GUI 5CX1 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
  Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS

5L81	Gen shed at MCA/REV: GS + 3.09 * R
	Where GS and R are calculated as follows:
	    GS = Max (0, 3.09 * (5L82 NIC + 0.48 * 5L81 NIC - 5L82_Over_Rating))
	    Y = 2L112 NLY + 0.06 * 5L81 NIC - 0.15 * GS
	    Z = -2L293 NLY + 0.05 * 5L81 NIC - 0.14 * GS
	    If Y > NLYPST_OL_PickupMW, R1 = 0.41 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
	    If Z > 2L293OLRAS_PickupMW, R2 = 0.50 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
	    R = Max (R1, R2)

5L82	Gen shed at REV/MCA: GS + 3.12 * R
	Where GS and R are calculated as follows:
	    GS = Max (0, 3.12 * (5L81 NIC + 0.46 * 5L82 NIC - 5L81_Over_Rating))
	    Y = 2L112 NLY + 0.06 * 5L82 NIC - 0.15 * GS
	    Z = -2L293 NLY + 0.05 * 5L82 NIC - 0.14 * GS
	    If Y > NLYPST_OL_PickupMW, R1 = 0.41 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
	    If Z > 2L293OLRAS_PickupMW, R2 = 0.50 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
	    R = Max (R1, R2)

5L87	Shed at MCA/REV: 1.12 * ((5L81 + 5L82 + 5L87) NIC – 4500)

5L44	GS1 = 3.5 * (5L81NIC + 0.32 * 5L44MDN – 5L81_ Over_Rating)
	GS2 = 15 * (2L20CSQ + 0.22 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 40.5 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_ Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.12* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.11 * M
	
	If Y > NLYPST_OL_PickupMW,
	    R1 = 0.45 * (Y - NLYPST_OL_ResetMW)
	    R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	    R5 = 0.05 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	    R2 = 0.52 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	    R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	- Shed at MCA/REV first, and then GMS/PCN the greatest of:
	➢ D1 * (GS1 + 3.5* Ra)
	➢ D2 * (GS2 + 15* Rb)
	➢ D3 * (GS3 + 40.5* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 2.25 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.1 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.25 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	- Reduce the flow on 2L129 from ARN to VIT.
	- Reduce SI generation and increase Peace generation

5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable.
	
	If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions:
	    If BC is exporting to US, then reduce BC to US export.
	    If BC is importing from US, then
	    - reduce (SI AND FBC) generation and increase Peace generation, or/and
	    - reduce (SI AND FBC) generation and increase import from US

The following are the generation shedding and RAS arming requirements:

If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then GS is the greater of:
- 1.13 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA + 2L112 NLY – 1650], or
- 1.15 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY + 2L112 NLY – 3800]

If 2L112 NLY >= 200 AND 0.10 * (5L81 + 5L82) NIC + 2L293 SEL <= 420, then GS is the greater of:
- 1.18 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA – 1650], or
- 1.20 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY – 3800]

If AB to BC >= 500 MW AND GS >= 1500 MW, then
- Arm DTT 5L94, and
- Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
- If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then
      Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.05 * AB to BC
   Otherwise
      Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS – 1.10 * AB to BC
- Total armed generation shedding must be limited to 2500 - AB to BC

If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
- Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: GS
- Total armed generation shedding must be limited to 2500

Arm DTT 2L112 RAS, If
- 2L112 NLY < 200 AND GS > 0 , or
- 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420

Table 2.35 – 5L83 AND AMC 5CX1 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- Limit: 5L82 NIC MW <= 5L82_Norm_Rating
  If TSA-PM alarms "VIOLATION_5L82_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to reduce the flow on 5L82 from NIC within its continuous rating:
  - Reduce SI generation and increase LM / VI / Peace generation, or
  - Reduce AB to BC transfer, or
  - Reduce ING to CUS transfer
- 5L44 Contingency:
  Limit: 2L64 KI2 + 0.17 * 5L44 ING + M <= 2L64_Over_Rating
  Where M is calculated as follows:
  Y = 2L112 BDY + 0.041 * 5L44 ING
  Z = 2L293 NLY + 0.034 * 5L44 ING
  If Y > NLYPST_OL_PickupMW, R1 = 0.087 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
  If Z > 2L293OLRAS_PickupMW, R2 = 0.107 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
  M = Max (R1, R2)

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements
5L83 AND AMC 5CX1 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	No shedding required
5L82	Gen shed at MCA/REV: GS + 3.33 * R Where GS and R are calculated as follows: GS = Max (0, 3.33 * (5L81 NIC + 0.43 * 5L82 NIC - 5L81_BypassAMC1_Over_Rating)) Y = 2L112 NLY + 0.05 * 5L82 NIC - 0.14 * GS Z = -2L293 NLY + 0.04 * 5L82 NIC - 0.13 * GS If Y > NLYPST_OL_PickupMW, R1 = 0.38 * (Y - NLYPST_OL_ResetMW), Else R1 = 0 If Z > 2L293OLRAS_PickupMW, R2 = 0.46 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0 R = Max (R1, R2)
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L87	Shed at MCA/REV: 1.28 * (5L81 NIC + 5L82 NIC + 5L87 NIC – 3950)

5L44	GS1 = 5.5 * (5L41KLY + 0.3 * 5L44MDN – 5L41_Over_Rating)
	GS2 = 13.5 * (2L20CSQ + 0.23 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 38 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_Over_ Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.06 * 5L44 MDN – 0.14* M
	Z = 2L293 SEL + 0.06 * 5L44 MDN – 0.13* M
	
	If Y > NLYPST_OL_PickupMW,
	    R1 = 0.3 * (Y - NLYPST_OL_ResetMW)
	    R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	    R5 = 0.05 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	    R2 = 0.35 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.12 * (Z - 2L293OLRAS_ResetMW)
	    R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	- Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➢ D1 * (GS1 + 5.5 * Ra)
	  ➢ D2 * (GS2 + 13.5 * Rb)
	  ➢ D3 * (GS3 + 38 * Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 0.75 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.1 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.15 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	  • Reduce the flow on 2L129 from ARN to VIT.
	  • Reduce SI generation and increase Peace generation

Table 2.36 – 5L83 AND AMC 5CX2 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- Limit: 5L81 NIC MW <= 5L81_Norm_Rating

  If TSA-PM alarms "VIOLATION_5L81_NORM_RATING", the BC Hydro Control Centre staff shall take the following actions to reduce the flow on 5L81 from NIC within its continuous rating:
  - Reduce SI generation and increase LM / VI / Peace generation, or
  - Reduce AB to BC transfer, or
  - Reduce ING to CUS transfer
- 5L44 Contingency:

  Limit: $2L64\ KI2 + 0.17 * 5L44\ ING + M <= 2L64\_Over\_Rating$

  Where M is calculated as follows:

  $Y = 2L112\ BDY + 0.030 * 5L44\ ING$

  $Z = 2L293\ NLY + 0.024 * 5L44\ ING$

  If $Y > NLYPST\_OL\_PickupMW$, $R1 = 0.068 * (Y - NLYPST\_OL\_ResetMW)$, Else R1 = 0

  If $Z > 2L293OLRAS\_PickupMW$, $R2 = 0.084 * (Z - 2L293OLRAS\_ResetMW)$, Else R2 = 0

  $M = Max\ (R1, R2)$

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements

5L83 AND AMC 5CX2 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Gen shed at MCA/REV: $GS + 3.26 * R$ Where GS and R are calculated as follows: $GS = Max\ (0, 3.26 * (5L82\ NIC + 0.45 * 5L81\ NIC - 5L82\_BypassAMC2\_Over\_Rating))$ $Y = 2L112\ NLY + 0.06 * 5L81\ NIC - 0.15 * GS$ $Z = -2L293\ NLY + 0.05 * 5L81\ NIC - 0.14 * GS$ If $Y > NLYPST\_OL\_PickupMW$, $R1 = 0.39 * (Y - NLYPST\_OL\_ResetMW)$, Else R1 = 0 If $Z > 2L293OLRAS\_PickupMW$, $R2 = 0.47 * (Z - 2L293OLRAS\_ResetMW)$, Else R2 = 0 $R = Max\ (R1, R2)$
5L82	No shedding required
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L87	Shed at MCA/REV: $1.28 * (5L81\ NIC + 5L82\ NIC + 5L87\ NIC - 4100)$

5L44	$GS1 = 3.5 * (5L81NIC + 0.26 * 5L44MDN - 5L81\_Over\_Rating)$
	$GS2 = 16.5 * (2L20CSQ + 0.25 * 5L44\ MDN - 2L20\_Over\_Rating)$
	$GS3 = 38.5 * (2L51COK + 0.12 * 5L44MDN - 2L51COK\_Over\_Rating)$
	
	$M = MAX\ (GS1, GS2, GS3, 0)$
	$Y = 2L112\ NLY + 0.06 * 5L44\ MDN - 0.13 * M$
	$Z = 2L293\ SEL + 0.05 * 5L44\ MDN - 0.12 * M$
	
	If $Y > NLYPST\_OL\_PickupMW$,
	    $R1 = 0.45 * (Y - NLYPST\_OL\_ResetMW)$
	    $R3 = 0.1 * (Y - NLYPST\_OL\_ResetMW)$
	    $R5 = 0.05 * (Y - NLYPST\_OL\_ResetMW)$
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If $Z > 2L293OLRAS\_PickupMW$,
	    $R2 = 0.5 * (Z - 2L293OLRAS\_ResetMW)$
	    $R4 = 0.1 * (Z - 2L293OLRAS\_ResetMW)$
	    $R6 = 0.05 * (Z - 2L293OLRAS\_ResetMW)$
	Else R2 = 0, R4 = 0, R6 = 0.
	
	$Ra = MAX\ (R1, R2)$
	$Rb = MAX\ (R3, R4)$
	$Rc = MAX\ (R5, R6)$
	
	- Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➤ $D1 * (GS1 + 3.5 * Ra)$
	  ➤ $D2 * (GS2 + 16.5 * Rb)$
	  ➤ $D3 * (GS3 + 38.5 * Rc)$
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.85 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.0 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.1 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	- Reduce the flow on 2L129 from ARN to VIT.
	- Reduce SI generation and increase Peace generation

Table 2.37 – 5L83 AND CHP 5CX1 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.
- 5L44 Contingency:
  Limit: 2L64 KI2 + 0.17 * 5L44 ING + M <= 2L64_Over_Rating
  Where M is calculated as follows:
    Y = 2L112 BDY + 0.038 * 5L44 ING
    Z = 2L293 NLY + 0.031 * 5L44 ING
    If Y > NLYPST_OL_PickupMW, R1 = 0.080 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
    If Z > 2L293OLRAS_PickupMW, R2 = 0.098 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
    M = Max (R1, R2)

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

Generation Shedding Requirements
5L83 AND CHP 5CX1 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS

5L81	Gen shed at MCA/REV: GS + 3.07 * R
	Where GS and R are calculated as follows:
	  GS = Max (0, 3.07 * (5L82 NIC + 0.49 * 5L81 NIC - 5L82_Over_Rating))
	  Y = 2L112 NLY + 0.06 * 5L81 NIC - 0.15 * GS
	  Z = -2L293 NLY + 0.05 * 5L81 NIC - 0.14 * GS
	  If Y > , R1 = 0.42 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
	  If Z > , R2 = 0.51 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
	  R = Max (R1, R2)

5L82	Gen shed at REV/MCA: GS + 3.10 * R
	Where GS and R are calculated as follows:
	  GS = Max (0, 3.10 * (5L81 NIC + 0.46 * 5L82 NIC - 5L81_Over_Rating))
	  Y = 2L112 NLY + 0.05 * 5L82 NIC - 0.15 * GS
	  Z = -2L293 NLY + 0.05 * 5L82 NIC - 0.14 * GS
	  If Y > NLYPST_OL_PickupMW, R1 = 0.41 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
	  If Z > 2L293OLRAS_PickupMW, R2 = 0.50 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
	  R = Max (R1, R2)

5L87	Shed at MCA/REV: 1.1 * ((5L81 + 5L82 + 5L87) NIC – 4450) MW

5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81_ Over_Rating)
	GS2 = 13.5 * (2L20CSQ + 0.25 * 5L44 MDN - 2L20_Over_Rating)
	GS3 = 37.5 * (2L51COK + 0.1 * 5L44MDN - 2L51COK_ Over_Rating)
	
	M = MAX (GS1, GS2, GS3, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.13* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.12* M
	
	If Y > NLYPST_OL_PickupMW,
	  R1 = 0.45 * (Y - NLYPST_OL_ResetMW)
	  R3 = 0.1 * (Y - NLYPST_OL_ResetMW)
	  R5 = 0.05 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0, R5 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	  R2 = 0.52 * (Z - 2L293OLRAS_ResetMW)
	  R4 = 0.1 * (Z - 2L293OLRAS_ResetMW)
	  R6 = 0.05 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0, R6 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	Rc = MAX (R5, R6)
	
	- Shed at MCA/REV first, and then GMS/PCN the greatest of:
	➢ D1 * (GS1 + 3.5* Ra)
	➢ D2 * (GS2 + 13.5* Rb)
	➢ D3 * (GS3 + 37.5* Rc)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.55 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.0 if shedding at GMS/PCN,
	D3 = 1.0 if shedding at MCA/REV, or
	D3 = 1.2 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	Reduce the flow on 2L129 from ARN to VIT.
	Reduce SI generation and increase Peace generation.

5L81 and 5L82	If generation shedding is armed, keep a minimum of 2 MCA, 1 REV, 2 SEV and 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is available, or keep a minimum of 2 MCA, 2 REV, 2 SEV and 1 & 2/3 equivalent SEV units on line post-shedding if SEL 5RX3 is unavailable. If TSA-PM alarms "C5L81_82 - MAX ARMED SHED VIOLATION", the BC Hydro Control Centre staff should take the following actions: If BC is exporting to US, then reduce BC to US export

If BC is importing from US, then
- reduce (SI AND FBC) generation and increase Peace generation, or/and
- reduce (SI AND FBC) generation and increase import from US

The following are the generation shedding and RAS arming requirements:

If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then GS is the greater of:
- 1.13 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA + 2L112 NLY − 2250], or
- 1.15 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY + 2L112 NLY − 3000]

If 2L112 NLY >= 200 AND 0.10 * (5L81 + 5L82) NIC + 2L293 SEL <= 420, then GS is the greater of:
- 1.18 * [(5L81 + 5L82 + 5L87) NIC + (2L92 + 2L93) SVA − 2250], or
- 1.20 * [(5L81 + 5L82) NIC + (5L41 + 5L42 + 2L90) KLY − 3000]

If AB to BC >= 500 MW AND GS >= 1500 MW, then
- Arm DTT 5L94, and
- Arm DTT 1L274 and DTT 1L275 except for the RAS blocking conditions specified in Section 9.3 of SOO 7T-17, and
- If 2L112 NLY < 200 MW OR 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420, then
    Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS − 1.05 * AB to BC
  Otherwise
    Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: 0.93 * GS − 1.10 * AB to BC
- Total armed generation shedding must be limited to 2500 - AB to BC

If AB to BC < 500 MW or [AB to BC >= 500 MW AND GS < 1500], then
- Shed at MCA/REV/SEV/KCL/ALH/WAN/BRX/WAX first, then GMS/PCN: GS
- Total armed generation shedding must be limited to 2500

Arm DTT 2L112 RAS, If
- 2L112 NLY < 200 AND GS > 0 , or
- 0.10 * (5L81 + 5L82) NIC + 2L293 SEL > 420

Table 2.38 – 5L83 AND CRK 5CX1 Series Capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
5L83 AND CRK 5CX1 Series capacitor Bank O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS

5L81	Gen shed at MCA/REV: GS + 3.10 * R
	Where GS and R are calculated as follows:
	   GS = Max (0, 3.10 * (5L82 NIC + 0.48 * 5L81 NIC - 5L82_Over_Rating))
	   Y = 2L112 NLY + 0.06 * 5L81 NIC - 0.15 * GS
	   Z = -2L293 NLY + 0.05 * 5L81 NIC - 0.14 * GS
	   If Y > NLYPST_OL_PickupMW, R1 = 0.41 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
	   If Z > 2L293OLRAS_PickupMW, R2 = 0.50 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
	   R = Max (R1, R2)

5L82	Gen shed at MCA/REV: GS + 3.04 * R
	Where GS and R are calculated as follows:
	   GS = Max (0, 3.04 * (5L81 NIC + 0.46 * 5L82 NIC - 5L81_Over_Rating))
	   Y = 2L112 NLY + 0.06 * 5L82 NIC - 0.17 * GS
	    Z = -2L293 NLY + 0.05 * 5L82 NIC - 0.15 * GS
	   If Y > NLYPST_OL_PickupMW, R1 = 0.41 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
	   If Z > 2L293OLRAS_PickupMW, R2 = 0.50 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
	   R = Max (R1, R2)

5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L87	Shed at MCA/REV: 1.1 * ((5L81 + 5L82 + 5L87) NIC – 4550) MW
5L44	Same as 5L83 O.O.S. Table 1.16

Table 2.40 – 5L83 AND (VAS T1 or T2) O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
5L83 AND (VAS T1 or T2) O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Tables A, B, C and D are applicable to this contingency
5L79	Tables A, B, C and D are applicable to this contingency
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
Bypass AMC 5CX1, or Bypass AMC 5CX2	No shedding required.
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L87	Same as 5L83 O.O.S. Table 1.16
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as 5L83 O.O.S. Table 1.16
5L91	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: • $1.20 * (5L91\ SEL + 5L96\ SEL - 1700)$, • $3.4 * (2L112\ NLY + 0.21 * 5L91\ SEL - 400)$, or • $3.8 * (2L293\ SEL + 0.17 * 5L91\ SEL - 400)$, and do not shed WAN for this requirement.

5L96	• Arm DTT 48L if VAS-WTS loop is closed AND 5L96 SEL > 600 MW
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or
	  ➢ $2.37 * (2L112\ NLY + 0.24 * (5L96\ SEL + Z) - 400)$, or
	  ➢ $2.37 * (2L112\ NLY + BDY\ Gen + 0.24 * (5L96\ SEL + Z) - 1120)$, or
	  ➢ $3.05 * (2L293\ SEL + 0.17 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement.
	$Y = 2050$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	$Y = 1820$ if none of ACK 5CX1 & 5CX2 is in service
	$Z = 48L\ KET$ if DTT 48L is armed, or
	$Z = 0$ if DTT 48L is not armed

5L98	• Arm DTT 73L if VAS-VNT loop is closed and 5L98 VAS > 620 MW
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ $1.25 * (5L91\ SEL + 5L98\ VAS + Z - Y)$, or
	  ➢ $2.75 * (2L112\ NLY + 0.22 * (5L98\ VAS + Z) - 400)$, or
	  ➢ $2.75 * (2L112\ NLY + BDY\ Gen + 0.22 * (5L98\ VAS + Z) - 1180)$, or
	  ➢ $3.18 * (2L293\ SEL + 0.17 * (5L98\ VAS + Z) - 400)$, and do not shed WAN for this requirement.
	$Y = 2120$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	$Y = 1950$ if none of ACK 5CX1 & 5CX2 is in service
	$Z = 73L\ RGA$ if DTT 73L is armed, or
	$Z = 0$ if DTT 73L is not armed

5L96 and 5L98	Tables A, B, C and D are applicable to this contingency
5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No gen shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No gen shedding required.

Table 2.41 – 5L83 AND (VAS T1 AND T2) O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Note 2 in Section 2.
- 5L91 and 5L96 contingency:
  - Limit: 5L91 SEL + 5L96 SEL + Y + Z < 2500 MW

    Y = 2L112 NLY if 2L112 NLY > 0, or Y = 0 if 2L112 NLY <= 0

    Z = 48L KET if both VAS-WTS and VAS-VNT loops are closed, or Z = 0 if VAS-WTS loop or/and VAS-VNT loop is/are open
  - If SEL 5RX3 is available, then limit:

    (FBC injection into SEL area) + W < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 − 1 SEV @ MIN.MW

    Otherwise, limit:

    (FBC injection into SEL area) + W < WAN shedable generation amount + ALH MW + BRX MW + WAX MW + 1000 − 1 SEV @ MIN.MW − 1 KCL @MIN.MW

    Where FBC injection into SEL area = 2L288 BTS + 2L289 BTS + FBC AAL Tie MW + 2L277 WAN - 60L225 KCL - 60L227 KCL − 2L286 SEL MW

    FBC AAL Tie MW = (2L294 AAL-NLY) AAL + (2L294 AAL-CBK) AAL MW

    W = AB to BC MW if AB to BC > 0, or

    W = 0 if AB to BC <= 0
  - Alarm if 5L91 SEL + 5L96 SEL + 2L112 NLY + Z < -700 MW AND MATL120S_PST230 >= 0 MW, or

    If 5L91 SEL + 5L96 SEL + 2L112 NLY + Z + MATL120S_PST230 < -700 MW AND MATL120S_PST230 < 0 MW

    Z = 48L KET if both VAS-WTS and VAS-VNT loops are closed, or Z = 0 if VAS-WTS loop or/and VAS-VNT loop is/are open

    If the alarm comes, the BC Hydro Control Centre staff must put more local generation on-line to prevent post-contingency frequency drop down below 59.0 Hz for loss of 5L91 and 5L96.

Generation Shedding Requirements
5L83 AND (VAS T1 AND T2) O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Same as Table A
5L79	Same gen shedding as 5L76 contingency with ACK 5CB8 in service in Table A
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
Bypass AMC 5CX1 or Bypass AMC 5CX2	No shedding required.
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L76 and 5L79	Same as Table D
5L87	Same as 5L83 O.O.S. Table 1.16
5L91 and 5L96	Same as VAX T1 AND T2 O.O.S. Table 1.41
5L44	Same as 5L83 O.O.S. Table 1.16

5L91	• Arm DTT 48L if both VAS-WTS and VAS-VNT loops are closed AND if (5L91 SEL + 5L96 SEL + 48L KET) > 1650 MW
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  • 1.16 * (5L91 SEL+5L96 SEL + Z − 1750), or
	  • 3.30 * (2L112 NLY + 0.21 * (5L91 SEL + Z) − 400), or
	  • 3.50 * (2L293 SEL + 0.18 * (5L91 SEL + Z) − 400), and do not shed WAN for this requirement.
	Z = 48L KET if DTT 48L RAS is armed, or
	Z = 0 if DTT 48L RAS is not armed.

5L96	• Arm DTT 48L if both VAS-WTS and VAS-VNT loops are closed AND if (5L91 SEL + 5L96 SEL + 48L KET) > 1700 MW
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25 * (5L91 SEL + 5L96 SEL + Z − Y), or
	  ➢ 2.63 * (2L112 NLY + 0.23 * (5L96 SEL + Z) − 400), or
	  ➢ 2.63 * (2L112 NLY + BDY Gen + 0.23 * (5L96 SEL + Z) − 1150), or
	  ➢ 3.10 * (2L293 SEL + 0.19 * (5L96 SEL + Z) − 400), and do not shed WAN for this requirement.
	Y = 2080 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1800 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L RAS is armed, or
	Z = 0 if DTT 48L RAS is not armed.

5L98	Same as 5L96 contingency in this table except that the value of 1700 MW included in the 1st bullet is changed to 1500 MW

5L96 & 5L98	• Arm DTT 48L if both VAS-WTS and VAS-VNT loops are closed AND if (5L91 SEL + 5L96 SEL + 48L KET) > 1650 MW
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ 1.25*(5L91 SEL + 5L96 SEL + Z − Y), or
	  ➢ 2.96 * (2L112 NLY + 0.26 * (5L96 SEL + Z) − 400), or
	  ➢ 2.96 * (2L112 NLY + BDY Gen + 0.26 * (5L96 SEL + Z) − 1160), or
	  ➢ 3.00 * (2L293 SEL + 0.20 * (5L96 SEL + Z) − 400), and do not shed WAN for this requirement.
	Y = 2010 if at least one of ACK 5CX1 & 5CX2 is in service, or
	Y = 1740 if none of ACK 5CX1 & 5CX2 is in service
	Z = 48L KET if DTT 48L RAS is armed, or
	Z = 0 if DTT 48L RAS is not armed.

5L92	Same as system normal Table A
5L94	Same as system normal Table A
Bypass GUI 5CX1	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.42 – 5L83 AND FBC's (75L or 76L) O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- Notes 2 and 3 in Section 2.

Generation Shedding Requirements
5L83 O.O.S. AND FBC's (75L or 76L) O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)
Note: Tables E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L76	Tables A, B, C and D are applicable to this contingency
5L79	Tables A, B, C and D are applicable to this contingency
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
Bypass AMC 5CX2, or Bypass AMC 5CX1	No shedding required
5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16
5L76 and 5L79	Tables A, B, C and D are applicable to this contingency
5L87	Same as 5L83 O.O.S. Table 1.16
5L91 and 5L96	Tables A, B, C and D are applicable to this contingency
5L44	Same as 5L83 O.O.S. Table 1.16
5L91	Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of: • $1.17 * (5L91\ SEL + 5L96\ SEL - Y)$, • $3.56 * (2L112\ NLY + 0.18 * 5L91\ SEL - 400)$, or • $4.10 * (2L293\ SEL + 0.18 * 5L91\ SEL - 400)$, and do not shed WAN for this requirement. $Y = 1715$ if SEL T1 & (T2 or/and T3) & T4 are in service, or $Y = 1675$ if SEL T1 or (T2 & T3) or T4 is O.O.S.
5L96	Tables A, B, C and D are applicable to this contingency
5L98	Tables A, B, C and D are applicable to this contingency

5L96 & 5L98	• Arm DTT 48L if 5L96 SEL > 800 MW and both VAS-WTS and VAS-VNT loops are closed
	• Shed at KCL/ALH/WAN/BRX/WAX first, then SEV the greatest of:
	  ➢ $1.25 * (5L91\ SEL + 5L96\ SEL + Z - Y)$, or
	  ➢ $2.50 * (2L112\ NLY + 0.24 * (5L96\ SEL + Z) - 400)$, or
	  ➢ $2.50 * (2L112\ NLY + BDY\ Gen + 0.24 * (5L96\ SEL + Z) - 1100)$, or
	  ➢ $2.93 * (2L293\ SEL + 0.20 * (5L96\ SEL + Z) - 400)$, and do not shed WAN for this requirement.
	$Y = 2050$ if at least one of ACK 5CX1 & 5CX2 is in service, or
	$Y = 1870$ if none of ACK 5CX1 & 5CX2 is in service
	$Z = 48L$ KET if DTT 48L is armed, or
	$Z = 0$ if DTT 48L is not armed.

5L92	Same as Table A
5L94	Same as Table A
Bypass GUI	No shedding required.
5L91 (1P) or 5L96 (1P) or 5L98 (1P)	No shedding required.

Table 2.43 – 5L83 AND 2L20 O.O.S., or 5L83 AND 2L44 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
➢ Notes 2 and 3 in Section 2.

Generation Shedding Requirements
5L83 AND 2L20 O.O.S., or 5L83 AND 2L44 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Same as 5L83 O.O.S. 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
5L87	Same as 5L83 O.O.S. Table 1.16

5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN – 5L81 Over Rating)
	GS2 = 12 * (2L22MDN + 0.3 * 5L44 MDN - 2L22_Over_Rating)
	
	M = MAX (GS1, GS2, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN – 0.12* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN – 0.10 * M
	
	If Y > NLYPST_OL_PickupMW,
	    R1 = 0.42 * (Y - NLYPST_OL_ResetMW)
	    R3 = 0.12 * (Y - NLYPST_OL_ResetMW)
	Else R1 = 0, R3 = 0.
	
	If Z > 2L293OLRAS_PickupMW,
	    R2 = 0.50 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.15 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	➢ D1 * (GS1 + 3.5* Ra)
	➢ D2 * (GS2 + 12* Rb)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.7 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.15 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16

Table 2.44 – 5L83 AND 2L22 O.O.S., or 5L83 AND 2L27 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Pre-Outage Restrictions:
- ➤ 5L44 Contingency:
  Limit: 2L64 KI2 + 0.22 * 5L44 ING + M <= 2L64_Over_Rating
  Where M is calculated as follows:
    Y = 2L112 BDY + 0.037 * 5L44 ING
    Z = 2L293 NLY + 0.029 * 5L44 ING
    If Y > NLYPST_OL_PickupMW, R1 = 0.231 * (Y - NLYPST_OL_ResetMW), Else R1 = 0
    If Z > 2L293OLRAS_PickupMW, R2 = 0.193 * (Z - 2L293OLRAS_ResetMW), Else R2 = 0
    M = Max (R1, R2)

  If TSA-PM alarms "VIOLATION_2L64 KI2 OVER RATING_5L44CTG", then the BC Hydro Control Centre staff shall take the following actions:
  - Increase flow on 2L129 ARN, or
  - Increase LM generation, or
  - Reduce import on 5L51 and 5L52.

- ➤ Notes 2 and 3 in Section 2

Generation Shedding Requirements
5L83 AND 2L22 O.O.S. or 5L83 AND 2L27 O.O.S. (Any Status of FBC's VAS-WTS and VAS-VNT Loops)

Note: Tables A, B, C, D, E and F are applicable to this Table.

CONTINGENCY	SHEDDING REQUIREMENTS
5L81	Same as 5L83 O.O.S. Table 1.16
5L82	Same as 5L83 O.O.S. Table 1.16
5L87	Same as 5L83 O.O.S. Table 1.16

5L44	GS1 = 3.5 * (5L81NIC + 0.35 * 5L44MDN − 5L81 Over Rating)
	GS2 = 11 * (2L20MDN + 0.32 * 5L44 MDN - 2L20 Over Rating)
	
	M = MAX (GS1, GS2, 0)
	Y = 2L112 NLY + 0.05 * 5L44 MDN − 0.12* M
	Z = 2L293 SEL + 0.05 * 5L44 MDN − 0.10 * M
	
	If Y > NLYPST_OL_PickupMW,
	    R1 = 0.42 * (Y - NLYPST OL ResetMW)
	    R3 = 0.13 * (Y - NLYPST OL ResetMW)
	Else R1 = 0, R3 = 0.
	
	If Z > 2L293OLRAS PickupMW,
	    R2 = 0.50 * (Z - 2L293OLRAS_ResetMW)
	    R4 = 0.15 * (Z - 2L293OLRAS_ResetMW)
	Else R2 = 0, R4 = 0.
	
	Ra = MAX (R1, R2)
	Rb = MAX (R3, R4)
	
	• Shed at MCA/REV first, and then GMS/PCN the greatest of:
	  ➤ D1 * (GS1 + 3.5* Ra)
	  ➤ D2 * (GS2 + 11* Rb)
	Where:
	D1 = 1.0 if shedding at MCA/REV, or
	D1 = 1.7 if shedding at GMS/PCN,
	D2 = 1.0 if shedding at MCA/REV, or
	D2 = 1.25 if shedding at GMS/PCN.
	
	Total armed generation shedding must be limited to 2500 MW. If exceeding the limit, the Operator can take the following actions:
	• Reduce the flow on 2L129 from ARN to VIT.
	• Reduce SI generation and increase Peace generation

5L81 and 5L82	Same as 5L83 O.O.S. Table 1.16