MPS Logic:
2017-04-17-a

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1 Ignored when A-Line Kicker Is Not Enabled, A-Line Secondary Target Is Out, TD11 Is In, YAG01 Is In, or YAG02 Is In

1.1 A-Line Secondary Target Flow Switch

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
Ok	T	120 Hz	120 Hz	120 Hz	–

Where
A = `TRGT_BSYA_960_FLOW_SW_STATE`

1.2 A-Line Secondary Target Klixon

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
Ok	T	120 Hz	120 Hz	120 Hz	–

Where
A = `TRGT_BSYA_960_KLIXON_STATE`

2 Ignored when A-Line Kicker Is Not Enabled, A-Line SL10 Is Closed, TD11 Is In, YAG01 Is In, or YAG02 Is In

2.1 Flowswitch: COLL BSYA 2060 (PC20)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `COLL_BSYA_2060_FLOW_SW_STATE`

2.2 Flowswitch: COLL BSYA 2410 (COLL24H)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `COLL_BSYA_2470_H_FLOW_SW_STATE`

2.3 Flowswitch: COLL BSYA 2410 (COLL24V)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `COLL_BSYA_2470_V_FLOW_SW_STATE`

2.4 Flowswitch: COLL BSYA 2410 (PC24)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = COLL_BSYA_2410_FLOW_SW_STATE

2.5 Flowswitch: COLL BSYA 2600 (PC26)

Name	A	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = COLL_BSYA_2600_FLOW_SW_STATE

2.6 Flowswitch: COLL BSYA 2990 (PC29)

Name	A	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = COLL_BSYA_2990_FLOW_SW_STATE

2.7 Flowswitch: COLL BSYA 3710 (C37)

Name	A	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = COLL_BSYA_3710_FLOW_SW_STATE

2.8 Flowswitch: COLL BSYA 4120 (3C1A)

Name	A	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = COLL_ESA0_4120_FLOW_SW_STATE

2.9 PIC Raw Charge Thresholds: BSYA 2061

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2061_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2061_LOSSH_THRESHOLD`

2.10 PIC Raw Charge Thresholds: BSYA 2120

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2120_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2120_LOSSH_THRESHOLD`

2.11 PIC Raw Charge Thresholds: BSYA 2220

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2220_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2220_LOSSH_THRESHOLD`

2.12 PIC Raw Charge Thresholds: BSYA 2321

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2321_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2321_LOSSH_THRESHOLD`

2.13 PIC Raw Charge Thresholds: BSYA 2411

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2411_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2411_LOSSH_THRESHOLD`

2.14 PIC Raw Charge Thresholds: BSYA 2472

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2472_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2472_LOSSH_THRESHOLD`

2.15 PIC Raw Charge Thresholds: BSYA 2473

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2473_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2473_LOSSH_THRESHOLD`

2.16 PIC Raw Charge Thresholds: BSYA 2474

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2474_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2474_LOSSH_THRESHOLD`

2.17 PIC Raw Charge Thresholds: BSYA 2475

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2475_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2475_LOSSH_THRESHOLD`

2.18 PIC Raw Charge Thresholds: BSYA 2520

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2520_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2520_LOSSH_THRESHOLD`

2.19 PIC Raw Charge Thresholds: BSYA 2601

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2601_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2601_LOSSH_THRESHOLD`

2.20 PIC Raw Charge Thresholds: BSYA 2861

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2861_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2861_LOSSH_THRESHOLD`

2.21 PIC Raw Charge Thresholds: BSYA 2990

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_2990_LOSSL_THRESHOLD`,
B = `PICM_BSYA_2990_LOSSH_THRESHOLD`

2.22 PIC Raw Charge Thresholds: BSYA 3320

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_3320_LOSSL_THRESHOLD`,
B = `PICM_BSYA_3320_LOSSH_THRESHOLD`

2.23 PIC Raw Charge Thresholds: BSYA 3720

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSYA_3720_LOSSL_THRESHOLD`,
B = `PICM_BSYA_3720_LOSSH_THRESHOLD`

2.24 PIC Raw Charge Thresholds: BSYA 3721

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSYA_3721_LOSSL_THRESHOLD,
B = PICM_BSYA_3721_LOSSH_THRESHOLD

2.25 PIC Raw Charge Thresholds: BSYA 3890

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSYA_3890_LOSSL_THRESHOLD,
B = PICM_BSYA_3890_LOSSH_THRESHOLD

2.26 PIC Trigger Missed (LN42)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSYA_2061_NO_TRIG_MISSED

2.27 Stopper BSYA 2275 (ST22) Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
MOVING	F	F	0 Hz	0 Hz	0 Hz	–
OUT	F	T	120 Hz	120 Hz	120 Hz	–
IN	T	F	0 Hz	0 Hz	0 Hz	–
BROKEN	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = STPR_BSYA_2275_ST22_OUT_LIM_STATE,
B = STPR_BSYA_2275_ST22_IN_LIM_STATE

2.28 Stopper BSYA 2930 (ST29) Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
MOVING	F	F	0 Hz	0 Hz	0 Hz	–
OUT	F	T	120 Hz	120 Hz	120 Hz	–
IN	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = STPR_BSYA_2930_ST29_OUT_LIM_STATE,
B = STPR_BSYA_2930_ST29_IN_LIM_STATE

2.29 Temperature RTD Summary: A-line Past SL10

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = RTD_BSYA_2060_PASTSL10SUM_STATUS

2.30 Vac Valve BSYA 4005 (IV40)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_BSYA_4005_POSITION_STATE

2.31 Vac Valve: VVFS BSYA 2855 (FV28)

Name	A	PC	MS	BYKIK	LHS
NOT_OPEN	F	0 Hz	0 Hz	0 Hz	–
OPEN	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVFS_BSYA_2855_POSITION_STATE

2.32 Vac Valve: VVPG BSYA 2635 (IV26)

Name	A	PC	MS	BYKIK	LHS
NOT_OPEN	F	0 Hz	0 Hz	0 Hz	–
OPEN	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_BSYA_2635_POSITION_STATE

2.33 Vac Valve: VVPG ESA0 4195 POSITION (IV41)

Name	A	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_ESA0_4195_POSITION_STATE

3 Ignored when A-Line Kicker Is Not Enabled, TD11 Is In, YAG01 Is In, or YAG02 Is In

3.1 A-Line Secondary Target Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
In	F	T	120 Hz	120 Hz	120 Hz	–
Out	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `TRGT_BSYA_960_IN_LIMSW_POSITION`,
B = `TRGT_BSYA_960_OUT_LIMSW_POSITION`

3.2 A-Line SL10 Position

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
state = (unsigned int) -1;

if ( SLIT_BSYA_2010_SL10_FB_IN_STATE &&
        SLIT_BSYA_2010_SL10_FT_IN_STATE &&
        SLIT_BSYA_2010_SL10_RB_IN_STATE &&
        SLIT_BSYA_2010_SL10_RT_IN_STATE )
{
    state = 0; /* SL10 is Closed */
}

else
{
    state = 1; /* SL10 is Not Closed */
}
```

Name	State	PC	MS	BYKIK	LHS
Closed	0	120 Hz	120 Hz	120 Hz	–
Not_Closed	1	120 Hz	120 Hz	120 Hz	–

3.3 Flowswitch: BPM BSYA 1020 (BPM10)

Name	*A*	PC	MS	BYKIK	LHS
IS_NOT_OK	F	0 Hz	0 Hz	–	–
OK	T	120 Hz	120 Hz	–	–

Where
A = BPM_BSYA_1020_FLOW_SW_STATE

3.4 Flowswitch: BPM BSYA 1240 (BPM12)

Name	*A*	PC	MS	BYKIK	LHS
IS_NOT_OK	F	0 Hz	0 Hz	–	–
OK	T	120 Hz	120 Hz	–	–

Where
A = BPM_BSYA_1240_FLOW_SW_STATE

3.5 Flowswitch: COLL BSYA 1015 (PC10)

Name	*A*	PC	MS	BYKIK	LHS
IS_NOT_OK	F	0 Hz	0 Hz	–	–
OK	T	120 Hz	120 Hz	–	–

Where
A = COLL_BSYA_1015_FLOW_SW_STATE

3.6 Flowswitch: COLL BSYA 1230 (PC12)

Name	*A*	PC	MS	BYKIK	LHS
IS_NOT_OK	F	0 Hz	0 Hz	–	–
OK	T	120 Hz	120 Hz	–	–

Where
A = COLL_BSYA_1230_FLOW_SW_STATE

3.7 Flowswitch: COLL BSYA 1490 (PC14)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `COLL_BSYA_1490_FLOW_SW_STATE`

3.8 Flowswitch: COLL BSYA 1700 (PC17)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `COLL_BSYA_1700_FLOW_SW_STATE`

3.9 PIC Raw Charge Thresholds: BSYA 1016

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	–	–
Over High Threshold	F	T	0 Hz	0 Hz	–	–
Under Low Threshold	T	F	0 Hz	0 Hz	–	–
OK	T	T	120 Hz	120 Hz	–	–

Where
A = `PICM_BSYA_1016_LOSSL_THRESHOLD`,
B = `PICM_BSYA_1016_LOSSH_THRESHOLD`

3.10 PIC Raw Charge Thresholds: BSYA 1021

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	–	–
Over High Threshold	F	T	0 Hz	0 Hz	–	–
Under Low Threshold	T	F	0 Hz	0 Hz	–	–
OK	T	T	120 Hz	120 Hz	–	–

Where
A = PICM_BSYA_1021_LOSSL_THRESHOLD,
B = PICM_BSYA_1021_LOSSH_THRESHOLD

3.11 PIC Raw Charge Thresholds: BSYA 1120

Name	B	A	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	–	–
Over High Threshold	F	T	0 Hz	0 Hz	–	–
Under Low Threshold	T	F	0 Hz	0 Hz	–	–
OK	T	T	120 Hz	120 Hz	–	–

Where
A = PICM_BSYA_1120_LOSSL_THRESHOLD,
B = PICM_BSYA_1120_LOSSH_THRESHOLD

3.12 PIC Raw Charge Thresholds: BSYA 1320

Name	B	A	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	–	–
Over High Threshold	F	T	0 Hz	0 Hz	–	–
Under Low Threshold	T	F	0 Hz	0 Hz	–	–
OK	T	T	120 Hz	120 Hz	–	–

Where
A = PICM_BSYA_1320_LOSSL_THRESHOLD,
B = PICM_BSYA_1320_LOSSH_THRESHOLD

3.13 PIC Raw Charge Thresholds: BSYA 1520

Name	B	A	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	–	–
Over High Threshold	F	T	0 Hz	0 Hz	–	–
Under Low Threshold	T	F	0 Hz	0 Hz	–	–
OK	T	T	120 Hz	120 Hz	–	–

Where
A = PICM_BSYA_1520_LOSSL_THRESHOLD,
B = PICM_BSYA_1520_LOSSH_THRESHOLD

3.14 PIC Raw Charge Thresholds: BSYA 1701A

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	–	–
Over High Threshold	F	T	0 Hz	0 Hz	–	–
Under Low Threshold	T	F	0 Hz	0 Hz	–	–
OK	T	T	120 Hz	120 Hz	–	–

Where
A = `PICM_BSYA_1701A_LOSSL_THRESHOLD`,
B = `PICM_BSYA_1701A_LOSSH_THRESHOLD`

3.15 PIC Raw Charge Thresholds: BSYA 1701B

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	–	–
Over High Threshold	F	T	0 Hz	0 Hz	–	–
Under Low Threshold	T	F	0 Hz	0 Hz	–	–
OK	T	T	120 Hz	120 Hz	–	–

Where
A = `PICM_BSYA_1701B_LOSSL_THRESHOLD`,
B = `PICM_BSYA_1701B_LOSSH_THRESHOLD`

3.16 PIC Raw Charge Thresholds: BSYA 1980

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	–	–
Over High Threshold	F	T	0 Hz	0 Hz	–	–
Under Low Threshold	T	F	0 Hz	0 Hz	–	–
OK	T	T	120 Hz	120 Hz	–	–

Where
A = `PICM_BSYA_1980_LOSSL_THRESHOLD`,
B = `PICM_BSYA_1980_LOSSH_THRESHOLD`

3.17 Temperature RTD Summary: A-Line Before SL10

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	–	–
OK	T	120 Hz	120 Hz	–	–

Where
A = `RTD_BSYA_1015_PRESL10SUM_STATUS`

3.18 Vac Valve: VVFS BSYA 1030 (FV10)

Name	*A*	PC	MS	BYKIK	LHS
NOT_OPEN	F	0 Hz	0 Hz	–	–
OPEN	T	120 Hz	120 Hz	–	–

Where
A = `VVFS_BSYA_1030_POSITION_STATE`

3.19 Vac Valve: VVPG BSYA 1018 (IV10)

Name	*A*	PC	MS	BYKIK	LHS
NOT_OPEN	F	0 Hz	0 Hz	–	–
OPEN	T	120 Hz	120 Hz	–	–

Where
A = `VVPG_BSYA_1018_POSITION_STATE`

4 Ignored when BX01/BX02 Is Off, YAG01 Is In, or YAG02 Is In

4.1 Toroid Comparator Dogleg 1 (IM02 vs IM03)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Downstream > Upstream	F	T	0 Hz	0 Hz	0 Hz	–
Upstream > Downstream	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `TC203L1_STATE`,
B = `TC203L2_STATE`

5 Ignored when BX01/BX02 Is On, YAG01 Is In, or YAG02 Is In

5.1 BXS Status

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BEND_IN20_931_OK_STATE`

5.2 Toroid Comparator Inj Spectrometer (IM02 vs IMS1)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Downstream > Upstream	F	T	0 Hz	0 Hz	0 Hz	–
Upstream > Downstream	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `TC2S1L1_STATE`,
B = `TC2S1L2_STATE`

6 Ignored when BXG Is Off or YAG01 Is In

6.1 Wakefield Shield Gun Spectrometer

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	10 Hz	10 Hz	10 Hz	–

Where
A = `WL_BL231_IN_STATE`

7 Ignored when BXG Is On or YAG01 Is In

7.1 Wakefield Shield Straight Ahead

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `WL_BL231_OUT_STATE`

8 Ignored when Diag Stopper HFX DG2 Is In, Diag Stopper HFX UM6 Is In, Diag Stopper XCS SB1 Is In, Spoiler SP0 Is In, ST1/ST2 Are In, Stopper SH1 Is In, Stopper SH2 Is In, Stopper XRT S5 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, XCS Is Not In Main Line, YAG01 Is In, or YAG02 Is In

8.1 XCS SB1 VGC 02 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `XCS_SB1_VGC_02_OPN_DI_POSITION`,
B = `XCS_SB1_VGC_02_CLS_DI_POSITION`

8.2 XCS SB2 VGC 01 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `XCS_SB2_VGC_01_OPN_DI_POSITION`,
B = `XCS_SB2_VGC_01_CLS_DI_POSITION`

9 Ignored when Diag Stopper HFX DG2 Is In, Diag Stopper HFX UM6 Is In, Spoiler SP0 Is In, ST1/ST2 Are In, Stopper S5B Is In, Stopper SH1 Is In, Stopper SH2 Is In, Stopper XRT S5 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

9.1 CXI Configuration 1 Summary

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/*
state = 0 beam dump
state = 1 beam allowed
state = 2 other, beam allowed
*/

/* Initialize to a guard value */
state = (unsigned int) -1;
{
int evalCXIConfigOne = -1;
{
        if ( CXI_MPS_CFG_1_CONFID ) /* EPS PLC asserts we are in config
            1 */
        {
                /* Evaluate inputs to identify if we're in beam dump
                   state for Cfg 1 */
                if ((! CXI_DG1_MMS_03_A_POSITION) ||
                (! CXI_DG2_MMS_06_B_POSITION) ||
                (! CXI_SC1_VGC_02_OPN_DI_POSITION) )
                {
                        evalCXIConfigOne = 0;
                }
                else
                {
                        evalCXIConfigOne = 1;
                }
        }
}
```

```
switch( evalCXIConfigOne )
{
        case 0: state = 0; break;
        case 1: state = 1; break;
        default: state = 2; break;
}
}
```

Name	State	PC	MS	BYKIK	LHS
Config 1 Fault	0	0 Hz	0 Hz	0 Hz	–
Config 1 Ok	1	120 Hz	120 Hz	120 Hz	–
Not In Config 1	2	120 Hz	120 Hz	120 Hz	–

9.2 CXI Configuration 2 Summary

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/*
state = 0 beam dump
state = 1 beam allowed
state = 2 other, beam allowed
*/

/* Initialize to a guard value */
state = (unsigned int) -1;
{
int evalCXIConfigTwo = -1;
{
        if ( CXI_MPS_CFG_2_CONFID ) /* EPS PLC asserts we are in config
            2 */
        {
                /* Evaluate inputs to identify if we're in beam dump
                    state for Cfg 2 */
                if (    (! CXI_DG1_MMS_03_A_POSITION) ||
                        (! CXI_SC1_VGC_02_OPN_DI_POSITION) || /* If the
                            valve is not open, trip */
                        (       (! CXI_DIA_ATTEN_OK_POSITION) && /* DIA
                            attenuation */
                                (! (    CXI_DG1_MMS_08_B_POSITION &&
                                                CXI_DG1_MMS_08_B_POSITION
                                                    &&
```

```
                                                        CXI_DG2_MMS_08_B_POSITION
                                                            &&
                                                        CXI_DG2_MMS_09_B_POSITION
                                                            &&
                                                        CXI_DG2_MMS_10_B_POSITION
                                                            &&
                                                        CXI_DG4_MMS_05_B_POSITION
                                                            &&
                                                        CXI_DG4_MMS_03_B_POSITION

                                                    )
                                                )
                                            )
                                            )
                        {
                                evalCXIConfigTwo = 0;
                        }
                        else
                        {
                                evalCXIConfigTwo = 1;
                        }
        }
}

switch( evalCXIConfigTwo )
{
        case 0: state = 0; break;
        case 1: state = 1; break;
        default: state = 2; break;
}
}
```

Name	State	PC	MS	BYKIK	LHS
Faulted	0	0 Hz	0 Hz	0 Hz	–
Ok	1	120 Hz	120 Hz	120 Hz	–
Not In Config 2	2	120 Hz	120 Hz	120 Hz	–

9.3 CXI Configuration 3 Summary

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/*
```

```
state = 0 beam dump
state = 1 beam allowed
state = 2 other, beam allowed
*/

/* Initialize to a guard value */
state = (unsigned int) -1;
{
int evalCXIConfigThree = -1;
{
        if ( CXI_MPS_CFG_3_CONFID ) /* EPS PLC asserts we are in config
            3 */
        {
                /* Evaluate inputs to identify if we're in beam dump
                   state for Cfg 3 */
                if ((! CXI_DG1_MMS_03_A_POSITION) ||
                (! CXI_SC1_VGC_02_OPN_DI_POSITION) )
                {
                        evalCXIConfigThree = 0;
                }
                else
                {
                        evalCXIConfigThree = 1;
                }
        }
}

switch( evalCXIConfigThree )
{
        case 0: state = 0; break;
        case 1: state = 1; break;
        default: state = 2; break;
}
}
```

Name	State	PC	MS	BYKIK	LHS
Faulted	0	0 Hz	0 Hz	0 Hz	–
Ok	1	120 Hz	120 Hz	120 Hz	–
Not in Config 3	2	120 Hz	120 Hz	120 Hz	–

9.4 CXI Configuration 4 Summary

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/*
state = 0 beam dump
state = 1 beam allowed
state = 2 other, beam allowed
*/

/* Initialize to a guard value */
state = (unsigned int) -1;
{
int evalCXIConfigFour = -1;
{
        if ( CXI_MPS_CFG_4_CONFID ) /* EPS PLC asserts we are in config
            4 */
        {
                /* Evaluate inputs to identify if we're in beam dump
                   state for Cfg 4 */
                if ((! CXI_DG1_MMS_03_A_POSITION) ||
                (! CXI_SC1_VGC_02_OPN_DI_POSITION) )
                {
                        evalCXIConfigFour = 0;
                }
                else
                {
                        evalCXIConfigFour = 1;
                }
        }
}

switch( evalCXIConfigFour )
{
        case 0: state = 0; break;
        case 1: state = 1; break;
        default: state = 2; break;
}
}
```

Name	State	PC	MS	BYKIK	LHS
Faulted	0	0 Hz	0 Hz	0 Hz	–
Ok	1	120 Hz	120 Hz	120 Hz	–
Not In Config 4	2	120 Hz	120 Hz	120 Hz	–

9.5 CXI Configuration 5 Summary

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/*
state = 0 beam dump
state = 1 beam allowed
state = 2 other, beam allowed
*/

/* Initialize to a guard value */
state = (unsigned int) -1;
{
int evalCXIConfigFive = -1;
{
        if ( CXI_MPS_CFG_5_CONFID ) /* EPS PLC asserts we are in config
            5 */
        {
                /* Evaluate inputs to identify if we're in beam dump
                   state for Cfg 5 */
                if ((! CXI_DG1_MMS_03_A_POSITION) ||
                (! CXI_SC1_VGC_02_OPN_DI_POSITION) )
                {
                        evalCXIConfigFive = 0;
                }
                else
                {
                        evalCXIConfigFive = 1;
                }
        }
}

switch( evalCXIConfigFive )
{
        case 0: state = 0; break;
        case 1: state = 1; break;
        default: state = 2; break;
```

```
}
}
```

Name	State	PC	MS	BYKIK	LHS
Faulted	0	0 Hz	0 Hz	0 Hz	–
Ok	1	120 Hz	120 Hz	120 Hz	–
Not In Config 5	2	120 Hz	120 Hz	120 Hz	–

9.6 CXI Configuration 6 Summary

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/*
state = 0 beam dump
state = 1 beam allowed
state = 2 other, beam allowed
*/

/* Initialize to a guard value */
state = (unsigned int) -1;
{
int evalCXIConfigSix = -1;
{
        if ( CXI_MPS_CFG_6_CONFID ) /* EPS PLC asserts we are in config
            6 */
        {
                /* Evaluate inputs to identify if we're in beam dump
                   state for Cfg 6 */
                if ((! CXI_DG1_MMS_03_A_POSITION) ||
                        (! CXI_DG2_MMS_06_B_POSITION) ||
                (! CXI_SC2_VGC_02_OPN_DI_POSITION) )
                {
                        evalCXIConfigSix = 0;
                }
                else
                {
                        evalCXIConfigSix = 1;
                }
        }
}

switch( evalCXIConfigSix )
```

```
{
        case 0: state = 0; break;
        case 1: state = 1; break;
        default: state = 2; break;
}
}
```

Name	State	PC	MS	BYKIK	LHS
Faulted	0	0 Hz	0 Hz	0 Hz	–
Ok	1	120 Hz	120 Hz	120 Hz	–
Not In Config 6	2	120 Hz	120 Hz	120 Hz	–

9.7 CXI Configuration 7 Summary

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/*
state = 0 beam dump
state = 1 beam allowed
state = 2 other, beam allowed
*/

/* Initialize to a guard value */
state = (unsigned int) -1;
{
int evalCXIConfigSeven = -1;
{
        if ( CXI_MPS_CFG_7_CONFID ) /* EPS PLC asserts we are in config
            7 */
        {
                /* Evaluate inputs to identify if we're in beam dump
                   state for Cfg 7 */
                if ((! CXI_DG1_MMS_03_A_POSITION)       ||
                        (! CXI_SC1_VGC_02_OPN_DI_POSITION) ||
                (! CXI_SC2_VGC_02_OPN_DI_POSITION) )
                {
                        evalCXIConfigSeven = 0;
                }
                else
                {
                        evalCXIConfigSeven = 1;
                }
```

```
        }
}

switch( evalCXIConfigSeven )
{
        case 0: state = 0; break;
        case 1: state = 1; break;
        default: state = 2; break;
}
}
```

Name	State	PC	MS	BYKIK	LHS
Faulted	0	0 Hz	0 Hz	0 Hz	–
Ok	1	120 Hz	120 Hz	120 Hz	–
Not In Config 7	2	120 Hz	120 Hz	120 Hz	–

9.8 CXI KB2 VGC 02 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `CXI_KB2_VGC_02_OPN_DI_POSITION`,
B = `CXI_KB2_VGC_02_CLS_DI_POSITION`

9.9 CXI MPS PLC Readiness Status

Name	*A*	PC	MS	BYKIK	LHS
PLC Not OK	F	0 Hz	0 Hz	0 Hz	–
PLC OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `CXI_MPS_PLC_01_OK_STATUS`

9.10 CXI User Patch Panel 1 Ready

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `CXI_USR_01_MPSFAULT_STATUS`

9.11 CXI User Patch Panel 2 Ready

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `CXI_USR_02_MPSFAULT_STATUS`

9.12 CXI:DG1:VGC:01 Gate Valve Open Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `CXI_DG1_VGC_01_OPN_DI_POSITION`

9.13 CXI:DG1:VGC:02 Gate Valve Open Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `CXI_DG1_VGC_02_OPN_DI_POSITION`

9.14 CXI:DG2:VGC:01 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `CXI_DG2_VGC_01_OPN_DI_POSITION`,
B = `CXI_DG2_VGC_01_CLS_DI_POSITION`

9.15 CXI:DG2:VGC:02 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `CXI_DG2_VGC_02_OPN_DI_POSITION`,
B = `CXI_DG2_VCG_02_CLS_DI_POSITION`

9.16 CXI:DG4:VGC:01 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `CXI_DG4_VGC_01_OPN_DI_POSITION`,
B = `CXI_DG4_VGC_01_CLS_DI_POSITION`

9.17 CXI:DSC:VGC:01 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `CXI_DSC_VGC_01_OPN_DI_POSITION`,
B = `CXI_DSC_VGC_01_CLS_DI_POSITION`

9.18 CXI:KB1:VGC:01 Gate Valve Open Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `CXI_KB1_VGC_01_OPN_DI_POSITION`

9.19 CXI:KB1:VGC:02 Gate Valve Open Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `CXI_KB1_VGC_02_OPN_DI_POSITION`

9.20 CXI:KB2:VGC:01 Gate Valve Open Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = CXI_KB2_VGC_01_OPN_DI_POSITION

9.21 CXI:SC1:VGC:01 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = CXI_SC1_VGC_01_OPN_DI_POSITION,
B = CXI_SC1_VGC_01_CLS_DI_POSITION

9.22 CXI:SC3:VGC:01 Be Gate Valve Position - Status from PLC

Name	*A*	PC	MS	BYKIK	LHS
Moving or Broken	F	0 Hz	0 Hz	0 Hz	–
Open or Closed	T	120 Hz	120 Hz	120 Hz	–

Where
A = CXI_SC3_VGC_01_OPN_DI_POSITION

9.23 HF4 LAM VGC 01 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = HF4_LAM_VGC_01_OPN_DI_POSITION

10 Ignored when Diag Stopper HFX DG2 Is In, Diag Stopper HFX UM6 Is In, Spoiler SP0 Is In, ST1/ST2 Are In, Stopper SH1 Is In, Stopper SH2 Is In, Stopper XRT S5 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, XCS Is Not In Main Line, YAG01 Is In, or YAG02 Is In

10.1 XCS SB1 Diagnostic Stopper Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `XCS_SB1_STP_01_OPN_DI_POSITION`,
B = `XCS_SB1_STP_01_CLS_DI_POSITION`

10.2 XCS SB1 VGC 01 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `XCS_SB1_VGC_01_OPN_DI_POSITION`,
B = `XCS_SB1_VGC_01_CLS_DI_POSITION`

11 Ignored when Diag Stopper HFX DG2 Is In, Diag Stopper HFX UM6 Is In, Spoiler SP0 Is In, ST1/ST2 Are In, Stopper SH1 Is In, Stopper SH2 Is In, Stopper XRT S5 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

11.1 CXI XRT Laser Reference Mirror Position

Name	*A*	PC	MS	BYKIK	LHS
Mirror In Beam	F	0 Hz	0 Hz	0 Hz	–
Mirror Out of Beam	T	120 Hz	120 Hz	120 Hz	–

Where
A = `XRT_DIA_MMS_01_B_POSITION`

11.2 HFA:SND:VGC:01 Gate Valve Open Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `HFA_SND_VGC_01_OPN_DI_POSITION`

11.3 HFX:DIA:VGC:02 Gate Valve Open Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `HFX_DIA_VGC_02_OPN_DI_POSITION`

11.4 PPS Stopper S5B Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
In	F	T	–	–	–	–
Out	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `STPR_FEH1_5_S5BIN_POSITION`,
B = `STPR_FEH1_5_S5BOUT_POSITION`

11.5 XRT HXRAY DIA Isolation Valve HXX-DIA-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `HXX_DIA_VGC_01_CLS_DI_STATE`,
B = `HXX_DIA_VGC_01_OPN_DI_STATE`

12 Ignored when Diag Stopper HFX DG2 Is In, Diag Stopper HFX UM6 Is In, Spoiler SP0 Is In, ST1/ST2 Are In, Stopper SH1 Is In, Stopper SH2 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

12.1 HFX:DG2:VGC:01 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `HFX_DG2_VGC_01_OPN_DI_POSITION`

12.2 HFX:MON:VGC:01 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `HFX_MON_VGC_01_OPN_DI_POSITION`

12.3 HFX:MON:VGC:02 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `HFX_MON_VGC_02_OPN_DI_POSITION`

12.4 Stopper XRT S5 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `STPR_XRT1_1_S5OUT_POSITION`,
B = `STPR_XRT1_1_S5IN_POSITION`

13 Ignored when Diag Stopper HFX UM6 Is In, Spoiler SP0 Is In, ST1/ST2 Are In, Stopper MFX S4.5 Is In, Stopper SH1 Is In, Stopper SH2 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

13.1 MFX Beam Focusing Interlock (Beryllium Lens)

Name	*A*	PC	MS	BYKIK	LHS
Not Safe	F	0 Hz	0 Hz	0 Hz	–
Safe	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MFX_LENS_1_SAFE_STATE`

13.2 MFX MPS Summary - Downstream of Stopper 4.5

Name	*A*	PC	MS	BYKIK	LHS
Not Ok	F	0 Hz	0 Hz	0 Hz	–
Ok	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MFX_MPS_1_SUM_STATE`

14 Ignored when Diag Stopper HFX UM6 Is In, Spoiler SP0 Is In, ST1/ST2 Are In, Stopper SH1 Is In, Stopper SH2 Is In, Stopper XRT S6 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

14.1 MEC DV4 VCG 01 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MEC_DV4_VGC_01_OPN_DI_POSITION`

14.2 MEC DV5 VGC 01 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MEC_DV5_VGC_01_OPN_DI_POSITION`

14.3 MEC HXM VGC 01 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MEC_HXM_VGC_01_OPN_DI_POSITION`

14.4 MEC XT1 Reference Laser Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MEC_XT1_MMS_01_B_POSITION`

14.5 MEC XT1 VGC 01 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MEC_XT1_VGC_01_OPN_DI_POSITION`

14.6 MEC XT2 VGC 02 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MEC_XT2_VGC_02_OPN_DI_POSITION`

14.7 MEC XT2 VGC 03 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MEC_XT2_VGC_03_OPN_DI_POSITION`

14.8 MEC XT2 VGC 04 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MEC_XT2_VGC_04_OPN_DI_POSITION`

14.9 MEC XT2 VGC 05 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `MEC_XT2_VGC_05_OPN_DI_POSITION`,
B = `MEC_XT2_VGC_05_CLS_DI_POSITION`

14.10 MEC XT2 VGC 06 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MEC_XT2_VGC_06_OPN_DI_POSITION`

15 Ignored when Diag Stopper HFX UM6 Is In, Spoiler SP0 Is In, ST1/ST2 Are In, Stopper SH1 Is In, Stopper SH2 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

15.1 DG2 Diagnostic Stopper Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
In	F	T	–	–	–	–
Out	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `HFX_DG2_STP_01_IN_DI_POSITION`,
B = `HFX_DG2_STP_01_OUT_DI_POSITION`

15.2 MEC BXL VGC 01 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MEC_BXL_VGC_01_OPN_DI_POSITION`

15.3 MEC M3H Mirror and DG2 STP Fault

Name	*B*	*A*	PC	MS	BYKIK	LHS
In Transit: DG2 STP Not In Beam, M3H Mirror Not Out	F	F	0 Hz	0 Hz	0 Hz	–
In Transit: DG2 STP Not In Beam, M3H Mirror Out	F	T	120 Hz	120 Hz	120 Hz	–
Safe: DG2 STP In Beam, M3H Mirror Not Out	T	F	120 Hz	120 Hz	120 Hz	–
Safe: DG2 STP In Beam, M3H Mirror Out	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = HXX_HXM_MMS_01_B_POSITION,
B = HFX_DG2_STP_01_IN_DI_POSITION

15.4 MEC M3H Mirror Unknown Position Fault

Name	*B*	*A*	PC	MS	BYKIK	LHS
In Transit: M3H Mirror Neither In Nor Out	F	F	120 Hz	120 Hz	120 Hz	–
Out: M3H Mirror Out of Beam	F	T	120 Hz	120 Hz	120 Hz	–
In: M3H Mirror In Beam	T	F	120 Hz	120 Hz	120 Hz	–
Broken: M3H Mirror Both In And Out	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = HXX_HXM_MMS_01_B_POSITION,
B = HXX_HXM_MMS_01_INBEAM_POSITION

15.5 MEC XRT Attenuator Inspection Mirror Position

Name	*A*	PC	MS	BYKIK	LHS
Mirror Not Out	F	0 Hz	0 Hz	0 Hz	–
Mirror Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = MEC_HXM_MMS_04_B_POSITION

15.6 MFX Gate Valve Summary - Upstream of Stopper 4.5

Name	*A*	PC	MS	BYKIK	LHS
Not All Out	F	0 Hz	0 Hz	0 Hz	–
All Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = MFX_XRT_VGC_OUT_SUM_STATE

15.7 Stopper MFX S4.5 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = STPR_XRT_1_S45OUT_STATE,
B = STPR_XRT_1_S45IN_STATE

15.8 Stopper XRT S6 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
In	F	T	120 Hz	120 Hz	120 Hz	–
Out	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = STPR_XRT1_1_S6IN_POSITION,
B = STPR_XRT1_1_S6OUT_POSITION

15.9 XRT HXRAY LOM Isolation Valve HXX-LOM-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = HXX_LOM_VGC_01_CLS_DI_STATE,
B = HXX_LOM_VGC_01_OPN_DI_STATE

15.10 XRT HXRAY MXT Gate Valve HXX:MXT:VGC:01

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `HXX_MXT_VGC_01_OPN_DI_POSITION`

15.11 XRT HXRAY MXT Gate Valve HXX:MXT:VGC:02

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `HXX_MXT_VGC_02_OPN_DI_POSITION`

15.12 XRT HXRAY MXT Gate Valve HXX:MXT:VGC:03

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `HXX_MXT_VGC_03_CLS_DI_POSITION`,
B = `HXX_MXT_VGC_03_OPN_DI_POSITION`

15.13 XRT HXRAY MXT Gate Valve HXX:MXT:VGC:05

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `HXX_MXT_VGC_05_OPN_DI_POSITION`

16 Ignored when Laser Heater Attenuator Is In

16.1 Laser Heater Photodiode Shutter Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	–	–	–	0 Hz
Out	F	T	–	–	–	0 Hz
In	T	F	–	–	–	120 Hz
Broken	T	T	–	–	–	0 Hz

Where
A = `LHPHD_OUT_LIMIT_STATE`,
B = `LHPHD_IN_LIMIT_STATE`

16.2 OTRH1 Position When LH Atten Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	–	–	–	0 Hz
Out	F	T	–	–	–	120 Hz
In	T	F	–	–	–	0 Hz
Broken	T	T	–	–	–	0 Hz

Where
A = `OTRH1_OUT_LIMIT_STATE`,
B = `OTRH1_IN_LIMIT_STATE`

16.3 OTRH2 Position When LH Atten Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	–	–	–	0 Hz
Out	F	T	–	–	–	120 Hz
In	T	F	–	–	–	0 Hz
Broken	T	T	–	–	–	0 Hz

Where
A = `OTRH2_OUT_LIMIT_STATE`,
B = `OTRH2_IN_LIMIT_STATE`

17 Ignored when Spoiler SP0 Is In, ST1/ST2 Are In, Stopper S1 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

17.1 NEH AMO Laser Reference Mirror Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = SAS_MMM_01_B_POSITION

17.2 NEH AMO Valves Ok for Beam - Summary From PLC

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
Ok	T	120 Hz	120 Hz	120 Hz	–

Where
A = AMO_MPS_VAC_OK_SUM_STATE

17.3 NEH1 Camera 1124 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = CAMR_NEH1_1124_OUT_STATE,
B = CAMR_NEH1_1124_IN_STATE

17.4 NEH1 XTOD S1 Isolation Valve Summary

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VMPS_NEH_703_ISOL_S1_STATE`

18 Ignored when Spoiler SP0 Is In, ST1/ST2 Are In, Stopper S2 Is In, Stopper S2B Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

18.1 NEH SXR Differential Pump Isolation Valve SXR-DFP-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = SXR_DFP_VGC_01_CLS_DI_STATE,
B = SXR_DFP_VGC_01_OPN_DI_STATE

18.2 NEH SXR End Station Ready SXR-EXP-MPS-01

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = SXR_EXP_MPS_01_STATE

18.3 NEH SXR Intensity Monitor Isolation Valve SXR-FLX-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = SXR_FLX_VGC_01_CLS_DI_STATE,
B = SXR_FLX_VGC_01_OPN_DI_STATE

18.4 NEH SXR KB Optics Isolation Valve SXR-KBO-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = SXR_KBO_VGC_01_CLS_DI_STATE,
B = SXR_KBO_VGC_01_OPN_DI_STATE

18.5 NEH SXR Laser In-coupling Mirror Isolation Valve SXR-LIN-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = SXR_LIN_VGC_01_CLS_DI_STATE,
B = SXR_LIN_VGC_01_OPN_DI_STATE

19 Ignored when Spoiler SP0 Is In, ST1/ST2 Are In, Stopper S2 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

19.1 NEH Camera 2124 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `CAMR_NEH1_2124_OUT_STATE`,
B = `CAMR_NEH1_2124_IN_STATE`

19.2 NEH SXR Collimator 3 Isolation Valve SXR-COL-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `SXR_COL_VGC_01_CLS_DI_STATE`,
B = `SXR_COL_VGC_01_OPN_DI_STATE`

19.3 NEH SXR Exit Slits Isolation Valve SXR-EXS-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = SXR_EXS_VGC_01_CLS_DI_STATE,
B = SXR_EXS_VGC_01_OPN_DI_STATE

19.4 NEH SXR GMD VGC 01 Protection

Name	*B*	*A*	PC	MS	BYKIK	LHS
In Transit: SXR GMD VGC 01 In Motion	F	F	0 Hz	0 Hz	0 Hz	–
Safe: SXR GMD VGC 01 Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed: SXR GMD VGC 01 Closed	T	F	0 Hz	0 Hz	0 Hz	–
Error: SXR GMD VGC 01 Open and Closed	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = SXR_GMD_VGC_01_OPN_DI_POSITION,
B = SXR_GMD_VGC_01_CLS_DI_POSITION

19.5 NEH SXR Monochromator Tank Isolation Valve SXR-MON-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = SXR_MON_VGC_01_CLS_DI_STATE,
B = SXR_MON_VGC_01_OPN_DI_STATE

19.6 NEH SXR Photon Stoppers Isolation Valve SXR-PST-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = SXR_PST_VGC_01_CLS_DI_STATE,
B = SXR_PST_VGC_01_OPN_DI_STATE

19.7 NEH SXR Transmission Sample System Isolation Valve SXR-TSS-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = SXR_TSS_VGC_01_CLS_DI_STATE,
B = SXR_TSS_VGC_01_OPN_DI_STATE

19.8 NEH SXR Zero Order Interlock SXR-MON-MMS-06, SXR-EXS-MMS-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Slits Not Open, No Zero Order	F	F	120 Hz	120 Hz	120 Hz	–
Slits Not Open, Zero Order Fault	F	T	0 Hz	0 Hz	0 Hz	–
Slits Open, No Zero Order	T	F	120 Hz	120 Hz	120 Hz	–
Slits Open, Zero Order	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = SXR_MON_MMS_06_B_STATE,
B = SXR_EXS_MMS_01_B_STATE

19.9 NEH1 XTOD S2 Isolation Valve Summary

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VMPS_NEH_703_ISOL_S2_STATE`

20 Ignored when Spoiler SP0 Is In, ST1/ST2 Are In, Stopper SH1 Is In, Stopper SH2 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

20.1 UM6 Diagnostic Stopper Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
In	F	T	–	–	–	–
Out	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `HFX_UM6_STP_01_IN_DI_POSITION`,
B = `HFX_UM6_STP_01_OUT_DI_POSITION`

20.2 XRT HXRAY UM6 Isolation Valve HXX-UM6-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `HXX_UM6_VGC_01_CLS_DI_STATE`,
B = `HXX_UM6_VGC_01_OPN_DI_STATE`

20.3 XRT UM6 Camera Position HXX-UM6-CVP-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `HXX_UM6_CVP_01_B_STATE`,
B = `HXX_UM6_CVP_01_A_STATE`

21 Ignored when Spoiler SP0 Is In, ST1/ST2 Are In, Stopper SH1 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, XPP-NH3-POS-00 Beamline Is In, YAG01 Is In, or YAG02 Is In

21.1 NEH3 HXRAY DVD Isolation Valve HX3-DVD-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = HX3_DVD_VGC_01_CLS_DI_STATE,
B = HX3_DVD_VGC_01_OPN_DI_STATE

22 Ignored when Spoiler SP0 Is In, ST1/ST2 Are In, Stopper SH1 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, XPP-NH3-POS-00 Beamline Is Not In, YAG01 Is In, or YAG02 Is In

22.1 XPP SB2 VGC 01 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `XPP_SB2_VGC_01_OPN_DI_POSITION`,
B = `XPP_SB2_VGC_01_CLS_DI_POSITION`

22.2 XPP SB2 VGC 02 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `XPP_SB2_VGC_02_OPN_DI_POSITION`

22.3 XPP SB2 VGC 03 Gate Valve Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `XPP_SB2_VGC_03_OPN_DI_POSITION`

23 Ignored when Spoiler SP0 Is In, ST1/ST2 Are In, Stopper SH1 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

23.1 HX2 UVD VGC 01 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `HX2_SB1_VGC_01_OPN_DI_STATE`,
B = `HX2_SB1_VGC_01_CLS_DI_STATE`

23.2 HX3 MON VGC 01 Gate Valve Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `HX3_MON_VGC_01_OPN_DI_POSITION`,
B = `HX3_MON_VGC_01_CLS_DI_POSITION`

23.3 NEH1 Camera 124 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = CAMR_NEH1_124_OUT_STATE,
B = CAMR_NEH1_124_IN_STATE

23.4 NEH1 Camera 195 Position

Name	B	A	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = CAMR_NEH1_195_OUT_STATE,
B = CAMR_NEH1_195_IN_STATE

23.5 NEH1 XTOD H Isolation Valve Summary

Name	A	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = VMPS_NEH_703_ISOL_H_STATE

23.6 NEH2 HXRAY DVD Isolation Valve HX2-DVD-VGC-01

Name	B	A	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Fault	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = HX2_DVD_VGC_01_CLS_DI_STATE,
B = HX2_DVD_VGC_01_OPN_DI_STATE

23.7 NEH3 HXRAY UVD Isolation Valve HX3-UVD-VGC-01

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Closed	F	T	0 Hz	0 Hz	0 Hz	–
Open	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `HX3_UVD_VGC_01_CLS_DI_STATE`,
B = `HX3_UVD_VGC_01_OPN_DI_STATE`

24 Ignored when Spoiler SP0 Is In, ST1/ST2 Are In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

24.1 FEE Camera 1561 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `CAMR_FEE1_1561_OUT_STATE`,
B = `CAMR_FEE1_1561_IN_STATE`

24.2 FEE Camera 1692 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `CAMR_FEE1_1692_OUT_STATE`,
B = `CAMR_FEE1_1692_IN_STATE`

24.3 FEE Camera 1953 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = CAMR_FEE1_1953_OUT_STATE,
B = CAMR_FEE1_1953_IN_STATE

24.4 FEE Camera 2953 Position

Name	B	A	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = CAMR_FEE1_2953_OUT_STATE,
B = CAMR_FEE1_2953_IN_STATE

24.5 FEE Camera 852 Position

Name	B	A	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = CAMR_FEE1_852_OUT_STATE,
B = CAMR_FEE1_852_IN_STATE

24.6 FEE Camera 913 Position

Name	B	A	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = CAMR_FEE1_913_OUT_STATE,
B = CAMR_FEE1_913_IN_STATE

24.7 FEE Fast Shutter Valve and System Summary

Name	*A*	PC	MS	BYKIK	LHS
Not All Out And Ready	F	0 Hz	0 Hz	0 Hz	–
All Out And Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VMPS_FEE1_E101_FSHR_FAULT`

24.8 FEE Gas Flow Aperture Summary

Name	*A*	PC	MS	BYKIK	LHS
Not All Out Or In	F	0 Hz	0 Hz	0 Hz	–
All Out Or In	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VMPS_FEE1_E202_APRT_FAULT`

24.9 FEE Gas Flow Vacuum Isolation Valve Summary

Name	*A*	PC	MS	BYKIK	LHS
Not All Out	F	0 Hz	0 Hz	0 Hz	–
All Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VMPS_FEE1_E202_ISOV_FAULT`

24.10 FEE Instrument Vacuum Isolation Valve Summary

Name	*A*	PC	MS	BYKIK	LHS
Not All Out	F	0 Hz	0 Hz	0 Hz	–
All Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VMPS_FEE1_E101_ISOL_FAULT`

24.11 FEE Solid Attenuators - Gas Pressure Interlock

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/* Prevent beam if gas attenuator
* pressure is above a specified threshold,
* the gas valve is NOT CLOSED,
* AND interlocked solid attenuators are NOT OUT.
* Note that solid attenuators 3 and 4 are allowed to be in;
* they are not part of this logic.
*
* Gas pressure and valve status summary OK/Fault input comes from FEE
    PLC
* Dehong Zhang and Alex Wallace are contacts for this input
*/

state = (unsigned int) -1; /* Initialize to a guard value */

if (VMPS_FEE1_E202_NOGAS_THRESHOLD)
{
     state = 0; /* Gas attenuator interlock is OK (pressure is low
        enough and valve is closed), okay to run beam */
}

else if (SATT_FEE1_329_OUT_POSITION && SATT_FEE1_328_OUT_POSITION
        && SATT_FEE1_327_OUT_POSITION && SATT_FEE1_326_OUT_POSITION
        && SATT_FEE1_325_OUT_POSITION && SATT_FEE1_322_OUT_POSITION
        && SATT_FEE1_321_OUT_POSITION)
{
     state = 1; /* Interlocked solid attenuators are OUT, okay to run
        beam */
}

else
{
     state = 2; /* Interlocked solid attenuators are NOT ALL OUT, NOT
        okay to run beam */
}
```

Name	State	PC	MS	BYKIK	LHS
Gas Pressure Ok	0	120 Hz	120 Hz	120 Hz	–
Solid Att Out	1	120 Hz	120 Hz	120 Hz	–
Solid Att Not Out While Gas Pressure High	2	0 Hz	0 Hz	0 Hz	–

24.12 FEE Spectrometer Crystal - Beam Energy Too Low When Crystal Not Out

Name	*B*	*A*	PC	MS	BYKIK	LHS
Fault	F	F	0 Hz	0 Hz	0 Hz	–
Energy Ok	F	T	120 Hz	120 Hz	120 Hz	–
Crystal Out	T	F	120 Hz	120 Hz	120 Hz	–
Crystal Out and Energy Ok	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `XTAL_FEE1_441_ENERGY_STATE`,
B = `XTAL_FEE1_441_OUT_LIMSW_POSITION`

24.13 FEE Spectrometer Crystal - Pulse Energy Too High When Crystal Not Out

Name	*B*	*A*	PC	MS	BYKIK	LHS
Fault	F	F	0 Hz	0 Hz	0 Hz	–
Pulse Energy Ok	F	T	120 Hz	120 Hz	120 Hz	–
Crystal Out	T	F	120 Hz	120 Hz	120 Hz	–
Crystal Out and Pulse Energy Ok	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `XTAL_FEE1_441_PULSEENERGY_THRESHOLD`,
B = `XTAL_FEE1_441_OUT_LIMSW_POSITION`

24.14 FEE XTOD H Isolation Valve Summary

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = VMPS_FEE1_703_ISOL_H_FAULT

24.15 FEE XTOD S1 Isolation Valve Summary

Name	A	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = VMPS_FEE1_703_ISOL_S1_FAULT

24.16 FEE XTOD S2 Isolation Valve Summary

Name	A	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = VMPS_FEE1_703_ISOL_S2_FAULT

24.17 FEE1 M1S Mirror Beam Energy Upper Limit

Name	B	A	PC	MS	BYKIK	LHS
Fault	F	F	0 Hz	0 Hz	0 Hz	–
OK	F	T	120 Hz	120 Hz	120 Hz	–
OK	T	F	120 Hz	120 Hz	120 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = MIRR_FEE1_1560_OUT_LIMIT1_POSITION,
B = MIRR_FEE1_1560_ENERGY_STATE

24.18 FEE1 M1S Mirror State

Name	*B*	*A*	PC	MS	BYKIK	LHS
Not Out	F	F	120 Hz	120 Hz	120 Hz	–
Inconsistent	F	T	0 Hz	0 Hz	0 Hz	–
Inconsistent	T	F	0 Hz	0 Hz	0 Hz	–
Out	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MIRR_FEE1_1560_OUT_LIMIT1_POSITION`,
B = `MIRR_FEE1_1560_OUT_LIMIT2_POSITION`

24.19 Gas Detector Problem When FEE Spectrometer Crystal Not Out

Name	*B*	*A*	PC	MS	BYKIK	LHS
Fault	F	F	0 Hz	0 Hz	0 Hz	–
Gas Detector Ok	F	T	120 Hz	120 Hz	120 Hz	–
Crystal Out	T	F	120 Hz	120 Hz	120 Hz	–
Crystal Out and Gas Detector Ok	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `GDET_FEE1_1_CAL_OK_STATE`,
B = `XTAL_FEE1_441_OUT_LIMSW_POSITION`

24.20 HXR - Beam Energy Too Low With M1S Out

Name	*B*	*A*	PC	MS	BYKIK	LHS
Ok	F	F	120 Hz	120 Hz	120 Hz	–
Ok	F	T	120 Hz	120 Hz	120 Hz	–
Ok	T	F	120 Hz	120 Hz	120 Hz	–
Fault	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `MIRR_FEE1_1560_ENERGY_STATE`,
B = `MIRR_FEE1_1560_OUT_LIMIT1_POSITION`

25 Ignored when Stopper: BSY D2 Summary Is In

25.1 Stopper: ST1/ST2 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `STPR_FEE1_1_ST1ST2OUT_POSITION`,
B = `STPR_FEE1_1_ST1ST2IN_POSITION`

26 Ignored when Stopper: BSY D2 Summary Is In or TDUND Is In

26.1 HXRSS Beamline Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BMLN_UND1_1650_OUT_LMTSW_STATE`,
B = `BMLN_UND1_1650_IN_LMTSW_STATE`

26.2 HXRSS Chicane Bend Magnet Power Supply

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
ON	F	T	120 Hz	120 Hz	120 Hz	–
OFF	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BEND_UND1_1640_ON_STATE`,
B = `BEND_UND1_1640_OFF_STATE`

26.3 HXRSS Crystal Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = XTAL_UND1_1650_OUT_LMTSW_STATE,
B = XTAL_UND1_1650_IN_ENCDR_STATE

26.4 HXRSS Crystal Valid Position

Name	A	PC	MS	BYKIK	LHS
Not Valid	F	0 Hz	0 Hz	0 Hz	–
Valid	T	120 Hz	120 Hz	120 Hz	–

Where
A = XTAL_UND1_1650_POSITIONSTAT_STATE

26.5 HXRSS Mode State

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/*
 * state = 0 : full rate (120 Hz) beam allowed, HXRSS Seeded Mode
 * state = 1 : full rate (120 Hz) beam allowed, HXRSS SASE Mode
 * state = 2 : full rate (120 Hz) beam allowed, HXRSS Phase Shifter
    Mode
 * state = 3 : no beam allowed, HXRSS undefined state
*/

/* Initialize to a guard value */
state = (unsigned int) -1;

/*
 * Allow beam if HXRSS is ON, Seeded Mode: the raft is in;
 *                            the magnet is on in and tolerance;
 *                            the photon energy is OK;
 *                            the crystal is IN
 * Allow beam if HXRSS is OFF, SASE Mode: the raft is out;
 *                             the magnet is off;
 *                             the crystal is out
 * Allow beam if HXRSS is in Phase Shifter Mode: the raft is in;
 *                             the magnet is in ANY state;
 *                             the crystal is out
 * Otherwise, do not allow beam.
```

```
 */


/* Input Descriptions
*
* BEND_DMP1_400_INTOL_BRANGE_STATE= HXRSS Beam Energy OK when 10 GeV <
    E < 15 GeV
* XTAL_UND1_1650_OUT_LMTSW_STATE    = Crystal OUT Limit Switch
* XTAL_UND1_1650_IN_ENCDR_STATE      = Crystal IN Limit Switch, from
    encoder
* BMLN_UND1_1650_IN_LMTSW_STATE      = HXRSS Raft IN Limit Switch
* BMLN_UND1_1650_OUT_LMTSW_STATE    = HXRSS Raft OUT Limit Switch
* BEND_UND1_1640_INTOL_BMIN_STATE    = HXRSS Chicane Bend INTOL, greater
    than +0.6 kG-m
* BEND_UND1_1640_OFF_STATE                = HXRSS Chicane Bend String is
    OFF
* BEND_UND1_1640_ON_STATE                 = HXRSS Chicane Bend String is
    ON
*
*/

if ( BMLN_UND1_1650_IN_LMTSW_STATE &&
            BEND_UND1_1640_INTOL_BMIN_STATE &&
            BEND_UND1_1640_ON_STATE &&
            BEND_DMP1_400_INTOL_BRANGE_STATE &&
            ( XTAL_UND1_1650_IN_ENCDR_STATE   ) )
{
    state = 0; /* HXRSS ON, HXRSS Seeded Mode, okay to run beam */
}

else if ( BMLN_UND1_1650_OUT_LMTSW_STATE &&
            BEND_UND1_1640_OFF_STATE &&
            XTAL_UND1_1650_OUT_LMTSW_STATE )
{
    state = 1; /* HXRSS OFF,SASE Mode, okay to run beam */
}

else if ( BMLN_UND1_1650_IN_LMTSW_STATE &&
            XTAL_UND1_1650_OUT_LMTSW_STATE )
{
    state = 2; /* HXRSS in Phase Shifter Mode, okay to run beam */
}

else
{
```

```
    state = 3; /* HXRSS Undefined State, no beam allowed */
}
```

Name	State	PC	MS	BYKIK	LHS
HXRSS Seeded Mode	0	120 Hz	120 Hz	120 Hz	–
HXRSS SASE Mode	1	120 Hz	120 Hz	120 Hz	–
HXRSS Phase Shifter Mode	2	120 Hz	120 Hz	120 Hz	–
HXRSS Undefined State	3	0 Hz	0 Hz	0 Hz	–

26.6 SXRSS Grating/M1 GRAT UND1 934 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `GRAT_UND1_934_OUT_LIMIT_POSITION`,
B = `GRAT_UND1_934_IN_LIMIT_POSITION`

26.7 SXRSS M2 MIRR UND1 964 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `MIRR_UND1_964_OUT_LIMIT_POSITION`,
B = `MIRR_UND1_964_IN_LIMIT_POSITION`

26.8 SXRSS M3 MIRR UND1 966 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `MIRR_UND1_966_OUT_LIMIT_POSITION`,
B = `MIRR_UND1_966_IN_LIMIT_POSITION`

26.9 SXRSS Mode State

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/* Production MPS SXRSS Modes
 *
 * state = 0 : full rate (120 Hz) beam allowed, SXRSS Seeded Mode
 * state = 1 : full rate (120 Hz) beam allowed, SXRSS SASE Mode
 * state = 2 : full rate (120 Hz) beam allowed, Harmonic Mode
 * state = 3 : no beam allowed, SXRSS undefined state
 *
 * Allow beam if SXRSS is ON, Seeded Mode:
 *                              { grating/M1 is IN and M3 is IN or OUT
    }
 *                             OR
 *                             { slit is IN and grating/M1/M2/M3 are
   OUT }
 *                             chicane is ON;
 *                             e- beam position OK [mm]
 *                             e- beam energy   OK [GeV]
 *                             upstream undulators IN OK
 * Allow beam if SXRSS is OFF, SASE Mode:
 *                              grating/M1 is OUT;
 *                              slit is OUT;
 *                             M2 is OUT;
 *                             M3 is OUT;
 *                             e- beam position    OK [mm]
 * Allow beam if SXRSS is in Harmonic Mode:
 *                              grating/M1 is OUT;
 *                              slit is NOT_IN and NOT_OUT;
 *                             M2 is OUT;
```

```
*                                M3 is OUT;
*                                chicane is ON;
*                                e- beam position  OK  [mm]
*                                e- beam energy     OK       [GeV]
* Otherwise, do not allow beam.
*
* Input Descriptions
*
*  Link Node MPS PV Name                  Link Node MPS Fault Name
                Desciption
* ------------------------------
   --------------------------------
   ------------------------------------------------
*  BEND:UND1:940:ON_MPS                =  BEND_UND1_940_ON_STATE
              =  Chicane power supply on
*  GRAT:UND1:934:IN_LIMIT_MPS          =  GRAT_UND1_934_IN_LIMIT_POSITION
      =  Grating/M1 IN limit switch
*  GRAT:UND1:934:OUT_LIMIT_MPS         =
   GRAT_UND1_934_OUT_LIMIT_POSITION    =  Grating/M1 OUT limit switch
*  SLIT:UND1:962:IN_LIMIT_MPS          =  SLIT_UND1_962_IN_LIMIT_POSITION
      =  Slit IN limit switch
*  SLIT:UND1:962:OUT_LIMIT_MPS         =
   SLIT_UND1_962_OUT_LIMIT_POSITION    =  Slit OUT limit switch
*  MIRR:UND1:964:IN_LIMIT_MPS          =  MIRR_UND1_964_IN_LIMIT_POSITION
      =  M2 IN limit switch
*  MIRR:UND1:964:OUT_LIMIT_MPS         =
   MIRR_UND1_964_OUT_LIMIT_POSITION    =  M2 OUT limit switch
*  MIRR:UND1:966:IN_LIMIT_MPS          =  MIRR_UND1_966_IN_LIMIT_POSITION
      =  M3 IN limit switch
*  MIRR:UND1:966:OUT_LIMIT_MPS         =
   MIRR_UND1_966_OUT_LIMIT_POSITION    =  M3 OUT limit switch
*  MPS:UND1:950:SX_HRMNC_ENERGY_MPS =
   MPS_UND1_950_SX_HRMNC_ENERGY_STATE =  e- beam energy safe for
   Harmonic mode
*  MPS:UND1:950:SX_HRMNC_X_MPS         =  MPS_UND1_950_SX_HRMNC_X_STATE
      =  e- beam position safe for Harmonic mode
*  MPS:UND1:950:SX_SASE_X_MPS          =  MPS_UND1_950_SX_SASE_X_STATE
       =  e- beam position safe for SASE mode
*  MPS:UND1:950:SX_SS_ENERGY_MPS       =  MPS_UND1_950_SX_SS_ENERGY_STATE
      =  e- beam energy safe for Seeded mode
*  MPS:UND1:950:SX_SS_UND_MPS          =  MPS_UND1_950_SX_SS_UND_STATE
       =  Inserted upstream undulators safe for Seeded mode
*  MPS:UND1:950:SX_SS_X_MPS            =  MPS_UND1_950_SX_SS_X_STATE
         =  e- beam position safe for Seeded mode
*/
```

```
/* Initialize to a guard value */
state = (unsigned int) -1;

if (     ((GRAT_UND1_934_IN_LIMIT_POSITION &&
         (MIRR_UND1_966_IN_LIMIT_POSITION ||
             MIRR_UND1_966_OUT_LIMIT_POSITION)) ||
          (SLIT_UND1_962_IN_LIMIT_POSITION  &&
              GRAT_UND1_934_OUT_LIMIT_POSITION &&
            MIRR_UND1_964_OUT_LIMIT_POSITION &&
                MIRR_UND1_966_OUT_LIMIT_POSITION)) &&
         BEND_UND1_940_ON_STATE &&
         MPS_UND1_950_SX_SS_X_STATE &&
         MPS_UND1_950_SX_SS_ENERGY_STATE &&
         MPS_UND1_950_SX_SS_UND_STATE )
{
    state = 0; /* SXRSS Seeded Mode, okay to run beam */
}

else if ( GRAT_UND1_934_OUT_LIMIT_POSITION &&
         SLIT_UND1_962_OUT_LIMIT_POSITION &&
         MIRR_UND1_964_OUT_LIMIT_POSITION &&
         MIRR_UND1_966_OUT_LIMIT_POSITION &&
         MPS_UND1_950_SX_SASE_X_STATE )
{
    state = 1; /* SXRSS SASE Mode, okay to run beam */
}

else if ( GRAT_UND1_934_OUT_LIMIT_POSITION &&
         !SLIT_UND1_962_IN_LIMIT_POSITION && !
             SLIT_UND1_962_OUT_LIMIT_POSITION &&
         MIRR_UND1_964_OUT_LIMIT_POSITION &&
         MIRR_UND1_966_OUT_LIMIT_POSITION &&
         BEND_UND1_940_ON_STATE &&
         MPS_UND1_950_SX_HRMNC_X_STATE &&
         MPS_UND1_950_SX_HRMNC_ENERGY_STATE )
{
    state = 2; /* SXRSS Harmonic Mode, okay to run beam */
}

else
{
    state = 3; /* SXRSS Undefined State, no beam allowed */
}
```

Name	State	PC	MS	BYKIK	LHS
SXRSS Seeded Mode	0	120 Hz	120 Hz	120 Hz	–
SXRSS SASE Mode	1	120 Hz	120 Hz	120 Hz	–
SXRSS Harmonic Mode	2	120 Hz	120 Hz	120 Hz	–
SXRSS Undefined State	3	0 Hz	0 Hz	0 Hz	–

26.10 SXRSS SLIT UND1 962 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	120 Hz	120 Hz	120 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `SLIT_UND1_962_OUT_LIMIT_POSITION`,
B = `SLIT_UND1_962_IN_LIMIT_POSITION`

26.11 SXRSS Watchdog

Name	*A*	PC	MS	BYKIK	LHS
NOT_OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_UND1_950_SXRSS_WDOG_STATE`

27 Ignored when Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

27.1 BCS LION LTU1 404 Threshold

Name	*A*	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `LION404_STATE`

27.2 BCS LION LTU1 405 Threshold

Name	*A*	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `LION405_STATE`

27.3 BCS LION LTU1 504 Threshold

Name	*A*	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `LION504_STATE`

27.4 BCS LION LTU1 505 Threshold

Name	*A*	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = LION505_STATE

27.5 BCS LION LTU1 584 Threshold

Name	A	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = LION584_STATE

27.6 BCS LION LTU1 585 Threshold

Name	A	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = LION585_STATE

27.7 BCS LION LTU1 716 Threshold

Name	A	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = LION716_STATE

27.8 BCS LION LTU1 717 Threshold

Name	A	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = LION717_STATE

27.9 BCS LION LTU1 732 Threshold

Name	A	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `LION732_STATE`

27.10 BCS LION LTU1 733 Threshold

Name	A	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `LION733_STATE`

27.11 BCS LION LTU1 752 Threshold

Name	A	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `LION752_STATE`

27.12 BCS LION LTU1 753 Threshold

Name	A	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `LION753_STATE`

27.13 BCS LION LTU1 765 Threshold

Name	*A*	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `LION765_STATE`

27.14 BCS LION LTU1 766 Threshold

Name	*A*	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `LION766_STATE`

27.15 BOD UND1 1005

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BOD_UND1_1005_OUT_LIMIT_POSITION`,
B = `BOD_UND1_1005_IN_LIMIT_POSITION`

27.16 BOD UND1 1305

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BOD_UND1_1305_OUT_LIMIT_POSITION,
B = BOD_UND1_1305_IN_LIMIT_POSITION

27.17 BYD Watchdog

Name	A	PC	MS	BYKIK	LHS
NOT_OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = BEND_DMP1_400_BACT_WDOG_STATE

27.18 Magnet In Tolerance: QE31

Name	A	PC	MS	BYKIK	LHS
No	F	0 Hz	0 Hz	0 Hz	–
Yes	T	120 Hz	120 Hz	120 Hz	–

Where
A = QUAD_LTU1_720_INTOL_STATUS

27.19 Magnet In Tolerance: QUM1

Name	A	PC	MS	BYKIK	LHS
No	F	0 Hz	0 Hz	0 Hz	–
Yes	T	120 Hz	120 Hz	120 Hz	–

Where
A = QUAD_LTU1_820_INTOL_STATUS

27.20 Magnet In Tolerance: QUM2

Name	A	PC	MS	BYKIK	LHS
No	F	0 Hz	0 Hz	0 Hz	–
Yes	T	120 Hz	120 Hz	120 Hz	–

Where
A = QUAD_LTU1_840_INTOL_STATUS

27.21 Magnet In Tolerance: QUM3

Name	A	PC	MS	BYKIK	LHS
No	F	0 Hz	0 Hz	0 Hz	–
Yes	T	120 Hz	120 Hz	120 Hz	–

Where
A = QUAD_LTU1_860_INTOL_STATUS

27.22 Magnet In Tolerance: QUM4

Name	A	PC	MS	BYKIK	LHS
No	F	0 Hz	0 Hz	0 Hz	–
Yes	T	120 Hz	120 Hz	120 Hz	–

Where
A = QUAD_LTU1_880_INTOL_STATUS

27.23 Magnet Power: QE31

Name	A	PC	MS	BYKIK	LHS
Off	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = QUAD_LTU1_720_STATE_STATUS

27.24 Magnet Power: QUM1

Name	A	PC	MS	BYKIK	LHS
Off	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = QUAD_LTU1_820_STATE_STATUS

27.25 Magnet Power: QUM2

Name	*A*	PC	MS	BYKIK	LHS
Off	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = `QUAD_LTU1_840_STATE_STATUS`

27.26 Magnet Power: QUM3

Name	*A*	PC	MS	BYKIK	LHS
Off	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = `QUAD_LTU1_860_STATE_STATUS`

27.27 Magnet Power: QUM4

Name	*A*	PC	MS	BYKIK	LHS
Off	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = `QUAD_LTU1_880_STATE_STATUS`

27.28 OTR30 LTU1 449 Position When TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRS_LTU1_449_OUT_LMTSW_STATE`,
B = `OTRS_LTU1_449_IN_LMTSW_STATE`

27.29 OTR33 Position When TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTR33_0745_OUT_STATE`,
B = `OTR33_0745_IN_STATE`

27.30 PIC Raw Charge Thresholds: DMP1 698

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICS_DMP1_100_LOSSL_THRESHOLD`,
B = `PICS_DMP1_100_LOSSH_THRESHOLD`

27.31 PIC Raw Charge Thresholds: DMP1 699

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICS_DMP2_200_LOSSL_THRESHOLD`,
B = `PICS_DMP2_200_LOSSH_THRESHOLD`

27.32 Spoiler SP0 DMP1 765 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
In	F	T	120 Hz	120 Hz	120 Hz	–
Out	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = SPLR_DMP1_765_IN_LIMSW_POSITION,
B = SPLR_DMP1_765_OUT_LIMSW_POSITION

27.33 VVFS DMP1 107 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVFS_DMP1_107_OPEN_LMTSW_STATE

27.34 VVMG DMP1 743 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVMG_DMP1_743_POSITION_STATE

27.35 VVMG UND1 1645 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVMG_UND1_1645_OPEN_LMTSW_STATE

27.36 VVMG UND1 1655 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVMG_UND1_1655_OPEN_LMTSW_STATE

27.37 VVPG DMP1 355 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Open	F	T	120 Hz	120 Hz	120 Hz	–
Closed	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = VVPG_DMP1_355_OPENSTATUS_STATE,
B = VVPG_DMP1_355_CLOSEDSTATUS_STATE

27.38 YAG LTU1 743 Position When TDUND Not In (PSI Prof Mon)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = YAGS_LTU1_743_OUT_LIMIT_POSITION,
B = YAGS_LTU1_743_IN_LIMIT_POSITION

28 Ignored when Stopper: BSY D2 Summary Is In, TD11 Is In, YAG01 Is In, or YAG02 Is In

28.1 BCS PIC RAW Charge Threshold DMP 997

Name	*A*	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PIC997_STATE`

28.2 BCS PIC RAW Charge Threshold DMP 998

Name	*A*	PC	MS	BYKIK	LHS
Exceeded	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PIC998_STATE`

28.3 BLM Heartbeat: Dechirper LTU1 BLF545

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_BLF545_TEST_L_THRESHOLD`,
B = `BLM_LTU1_BLF545_TEST_H_THRESHOLD`

28.4 BLM Pedestal Thresholds: Dechirper LTU1 BLF545

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_BLF545_PED_L_THRESHOLD`,
B = `BLM_LTU1_BLF545_PED_H_THRESHOLD`

28.5 BLM Raw Charge Thresholds: Dechirper LTU1 BLF545

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_BLF545_LOSS_L_THRESHOLD`,
B = `BLM_LTU1_BLF545_LOSS_H_THRESHOLD`

28.6 BYKIK 120 Hz Abort Trigger

Name	*A*	PC	MS	BYKIK	LHS
Missed Trigger	F	0 Hz	0 Hz	0 Hz	–
Stable	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BYKIK_120HZ_ABRT_TRIG_MISSED`

28.7 BYKIK 120 Hz Standby Trigger

Name	*A*	PC	MS	BYKIK	LHS
Missed Trigger	F	0 Hz	0 Hz	0 Hz	–
Stable	T	120 Hz	120 Hz	120 Hz	–

Where
A = BYKIK_120HZ_STBY_TRIG_MISSED

28.8 BYKIK 30 Hz Abort Trigger

Name	*A*	PC	MS	BYKIK	LHS
Missed Trigger	F	0 Hz	0 Hz	0 Hz	–
Stable	T	120 Hz	120 Hz	120 Hz	–

Where
A = BYKIK_30HZ_ABRT_TRIG_MISSED

28.9 BYKIK 30 Hz Standby Trigger

Name	*A*	PC	MS	BYKIK	LHS
Missed Trigger	F	0 Hz	0 Hz	0 Hz	–
Stable	T	120 Hz	120 Hz	120 Hz	–

Where
A = BYKIK_30HZ_STBY_TRIG_MISSED

28.10 BYKIK Readback Signal

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BYKIK_THRESHOLD_UNDER_FAULT,
B = BYKIK_THRESHOLD_OVER_FAULT

28.11 LTU Dechirper - Horizontal Gap Too Small

Name	*B*	*A*	PC	MS	BYKIK	LHS
Both ends gap too small	F	F	0 Hz	0 Hz	0 Hz	–
Downstream end gap too small	F	T	0 Hz	0 Hz	0 Hz	–
Upstream end gap too small	T	F	0 Hz	0 Hz	0 Hz	–
Gap ok	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `DCHP_LTU1_555_GAP_LIMSW_NEGZ_POSITION`,
B = `DCHP_LTU1_555_GAP_LIMSW_POSZ_POSITION`

28.12 LTU Dechirper - Vertical Gap Too Small

Name	*B*	*A*	PC	MS	BYKIK	LHS
Both ends gap too small	F	F	0 Hz	0 Hz	0 Hz	–
Downstream end gap too small	F	T	0 Hz	0 Hz	0 Hz	–
Upstream end gap too small	T	F	0 Hz	0 Hz	0 Hz	–
Gap ok	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `DCHP_LTU1_545_GAP_LIMSW_NEGZ_POSITION`,
B = `DCHP_LTU1_545_GAP_LIMSW_POSZ_POSITION`

28.13 Magnet In Tolerance: BYD1

Name	*A*	PC	MS	BYKIK	LHS
No	F	0 Hz	0 Hz	0 Hz	–
Yes	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BEND_DMP1_400_INTOL_STATUS`

28.14 Magnet Power: BYD1

Name	*A*	PC	MS	BYKIK	LHS
Off	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = BEND_DMP1_400_STATE_STATUS

28.15 OTR30 LTU1 449 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = OTRS_LTU1_449_OUT_LMTSW_STATE,
B = OTRS_LTU1_449_IN_LMTSW_STATE

28.16 OTR33 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = OTR33_0745_OUT_STATE,
B = OTR33_0745_IN_STATE

28.17 TDUND Flow Switch Fault With TDUND Not Out

Name	*B*	*A*	PC	MS	BYKIK	LHS
Fault	F	F	0 Hz	0 Hz	0 Hz	–
Ok	F	T	120 Hz	120 Hz	120 Hz	–
Ok, TDUND Out	T	F	120 Hz	120 Hz	120 Hz	–
Ok	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `TDUND_FS_STATE`,
B = `DUMP_LTU1_970_TDUND_OUT_POSITION`

28.18 TDUND Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `DUMP_LTU1_970_TDUND_OUT_POSITION`,
B = `DUMP_LTU1_970_TDUND_IN_POSITION`

28.19 THZ-2 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `THZR_LTU1_741_OUT_LIMSW_POSITION`,
B = `THZR_LTU1_741_IN_LIMSW_POSITION`

28.20 Undulator Beam Energy Lower Limit

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BEND_DMP1_400_INTOL_BMIN_STATE`

28.21 VVFS LTU1 102 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VACFS_LTU1_102_STATE`

28.22 VVMG LTU1 174 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VACV_LTU1_174_STATE`

28.23 VVMG LTU1 355 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VACV_LTU1_355_STATE`

28.24 VVMG LTU1 670 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_0670_STATE

28.25 VVMG LTU1 742 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_0742_STATE

28.26 VVMG LTU1 774 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_0774_STATE

28.27 VVMG UND1 932 Position

Name	*A*	PC	MS	BYKIK	LHS
NOT_OUT	F	0 Hz	0 Hz	0 Hz	–
OUT	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVMG_UND1_932_OUT_LIMIT_POSITION

28.28 VVMG UND1 968 Position

Name	*A*	PC	MS	BYKIK	LHS
NOT_OUT	F	0 Hz	0 Hz	0 Hz	–
OUT	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VVMG_UND1_968_OUT_LIMIT_POSITION`

28.29 VVPG DMP1 103 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VACV_DMP_100_STATE`

28.30 VVPG DMP1 395 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VACV_DMP_395_STATE`

28.31 VVPG DMP1 700 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VACV_DMP_700_STATE`

28.32 VVPG LTU1 100 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VACV_LTU1_100_STATE

28.33 VVPG LTU1 265 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VACV_LTU1_265_STATE

28.34 VVPG LTU1 435 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_0435_STATE

28.35 VVPG LTU1 580 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_0580_STATE

28.36 VVPG LTU1 725 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_0725_STATE

28.37 VVPG LTU1 757 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_0757_STATE

28.38 VVPG LTU1 999 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_0999_STATE

28.39 VVPG UND1 1000 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VACV_LTU0_1000_OPEN_STATE

28.40 VVPG UND1 2500 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VACV_UND_2500_STATE`

28.41 YAG LTU1 743 Position (PSI Prof Mon)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `YAGS_LTU1_743_OUT_LIMIT_POSITION`,
B = `YAGS_LTU1_743_IN_LIMIT_POSITION`

29 Ignored when TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

29.1 BFW 1010 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_1010_OUT_STATE`,
B = `BFW_UND1_1010_IN_STATE`

29.2 BFW 110 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_110_OUT_STATE`,
B = `BFW_UND1_110_IN_STATE`

29.3 BFW 1110 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_1110_OUT_STATE`,
B = `BFW_UND1_1110_IN_STATE`

29.4 BFW 1210 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_1210_OUT_STATE`,
B = `BFW_UND1_1210_IN_STATE`

29.5 BFW 1310 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_1310_OUT_STATE`,
B = `BFW_UND1_1310_IN_STATE`

29.6 BFW 1410 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_1410_OUT_STATE`,
B = `BFW_UND1_1410_IN_STATE`

29.7 BFW 1510 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_1510_OUT_STATE`,
B = `BFW_UND1_1510_IN_STATE`

29.8 BFW 1610 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_1610_OUT_STATE`,
B = `BFW_UND1_1610_IN_STATE`

29.9 BFW 1710 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_1710_OUT_STATE`,
B = `BFW_UND1_1710_IN_STATE`

29.10 BFW 1810 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_1810_OUT_STATE,
B = BFW_UND1_1810_IN_STATE

29.11 BFW 1910 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_1910_OUT_STATE,
B = BFW_UND1_1910_IN_STATE

29.12 BFW 2010 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_2010_OUT_STATE,
B = BFW_UND1_2010_IN_STATE

29.13 BFW 210 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_210_OUT_STATE,
B = BFW_UND1_210_IN_STATE

29.14 BFW 2110 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_2110_OUT_STATE,
B = BFW_UND1_2110_IN_STATE

29.15 BFW 2210 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_2210_OUT_STATE,
B = BFW_UND1_2210_IN_STATE

29.16 BFW 2310 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_2310_OUT_STATE,
B = BFW_UND1_2310_IN_STATE

29.17 BFW 2410 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_2410_OUT_STATE,
B = BFW_UND1_2410_IN_STATE

29.18 BFW 2510 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_2510_OUT_STATE,
B = BFW_UND1_2510_IN_STATE

29.19 BFW 2610 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_2610_OUT_STATE,
B = BFW_UND1_2610_IN_STATE

29.20 BFW 2710 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_2710_OUT_STATE,
B = BFW_UND1_2710_IN_STATE

29.21 BFW 2810 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_2810_OUT_STATE,
B = BFW_UND1_2810_IN_STATE

29.22 BFW 2910 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_2910_OUT_STATE,
B = BFW_UND1_2910_IN_STATE

29.23 BFW 3010 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_3010_OUT_STATE,
B = BFW_UND1_3010_IN_STATE

29.24 BFW 310 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_310_OUT_STATE,
B = BFW_UND1_310_IN_STATE

29.25 BFW 3110 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_3110_OUT_STATE,
B = BFW_UND1_3110_IN_STATE

29.26 BFW 3210 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_3210_OUT_STATE,
B = BFW_UND1_3210_IN_STATE

29.27 BFW 3310 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_3310_OUT_STATE,
B = BFW_UND1_3310_IN_STATE

29.28 BFW 410 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_410_OUT_STATE,
B = BFW_UND1_410_IN_STATE

29.29 BFW 510 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_510_OUT_STATE,
B = BFW_UND1_510_IN_STATE

29.30 BFW 610 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BFW_UND1_610_OUT_STATE,
B = BFW_UND1_610_IN_STATE

29.31 BFW 710 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_710_OUT_STATE`,
B = `BFW_UND1_710_IN_STATE`

29.32 BFW 810 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_810_OUT_STATE`,
B = `BFW_UND1_810_IN_STATE`

29.33 BFW 910 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BFW_UND1_910_OUT_STATE`,
B = `BFW_UND1_910_IN_STATE`

29.34 BFW Inserted Count

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
unsigned int beamFinderWireInCount = 0;

/* "BFW UND1 XXX" is IN when BFW_UND1_XXX_OUT_STATE == 0 */
if (!( BFW_UND1_110_OUT_STATE)) { beamFinderWireInCount++; }
if (!( BFW_UND1_210_OUT_STATE)) { beamFinderWireInCount++; }
if (!( BFW_UND1_310_OUT_STATE)) { beamFinderWireInCount++; }
if (!( BFW_UND1_410_OUT_STATE)) { beamFinderWireInCount++; }
if (!( BFW_UND1_510_OUT_STATE)) { beamFinderWireInCount++; }
if (!( BFW_UND1_610_OUT_STATE)) { beamFinderWireInCount++; }
if (!( BFW_UND1_710_OUT_STATE)) { beamFinderWireInCount++; }
if (!( BFW_UND1_810_OUT_STATE)) { beamFinderWireInCount++; }
if (!( BFW_UND1_910_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_1010_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_1110_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_1210_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_1310_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_1410_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_1510_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_1610_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_1710_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_1810_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_1910_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_2010_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_2110_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_2210_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_2310_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_2410_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_2510_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_2610_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_2710_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_2810_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_2910_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_3010_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_3110_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_3210_OUT_STATE)) { beamFinderWireInCount++; }
if (!(BFW_UND1_3310_OUT_STATE)) { beamFinderWireInCount++; }

switch(beamFinderWireInCount)
{
    case 0:  state = 0; break; /* No BFWs in */
    case 1:  state = 1; break; /* One BFW in */
    default: state = 2; break; /* More than one BFW in */
}
```

Name	State	PC	MS	BYKIK	LHS
No BFWs In	0	120 Hz	120 Hz	120 Hz	–
One BFW In	1	10 Hz	10 Hz	10 Hz	–
More Than One BFW In	2	0 Hz	0 Hz	0 Hz	–

29.35 BLM Argonne Heartbeat (LN32)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_120_TEST_L_THRESHOLD`,
B = `BLM_UND1_120_TEST_H_THRESHOLD`

29.36 BLM Argonne Heartbeat (LN33)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_920_TEST_L_THRESHOLD`,
B = `BLM_UND1_920_TEST_H_THRESHOLD`

29.37 BLM Argonne Heartbeat (LN35)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1720_TEST_L_THRESHOLD,
B = BLM_UND1_1720_TEST_H_THRESHOLD

29.38 BLM Argonne Heartbeat (LN36)

Name	B	A	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_2520_QTL_THRESHOLD,
B = BLM_2520_QTH_THRESHOLD

29.39 BLM Argonne Heartbeat (LN37)

Name	B	A	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_3320_TEST_L_THRESHOLD,
B = BLM_UND1_3320_TEST_H_THRESHOLD

29.40 BLM HVPS LTU1 762

Name	B	A	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = HVPS_LTU1_762_LOW_FAULT,
B = HVPS_LTU1_762_HIGH_FAULT

29.41 BLM HVPS UND1 120

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = HVPS_UND1_120_LOW_FAULT,
B = HVPS_UND1_120_HIGH_FAULT

29.42 BLM HVPS UND1 1720

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = HVPS_UND1_1720_LOW_FAULT,
B = HVPS_UND1_1720_HIGH_FAULT

29.43 BLM HVPS UND1 2221

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = HVPS_UND1_2221_LOW_FAULT,
B = HVPS_UND1_2221_HIGH_FAULT

29.44 BLM HVPS UND1 2520

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = HVPS_UND1_2520_LOW_FAULT,
B = HVPS_UND1_2520_HIGH_FAULT

29.45 BLM HVPS UND1 3320

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = HVPS_UND1_3320_LOW_FAULT,
B = HVPS_UND1_3320_HIGH_FAULT

29.46 BLM HVPS UND1 920

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = HVPS_UND1_920_LOW_FAULT,
B = HVPS_UND1_920_HIGH_FAULT

29.47 BLM Pedestal Threshold: LTU1 722

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_722_PED_L_THRESHOLD`,
B = `BLM_LTU1_722_PED_H_THRESHOLD`

29.48 BLM Pedestal Threshold: LTU1 732

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_732_PED_L_THRESHOLD`,
B = `BLM_LTU1_732_PED_H_THRESHOLD`

29.49 BLM Pedestal Threshold: LTU1 762

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_762_PED_L_THRESHOLD`,
B = `BLM_LTU1_762_PED_H_THRESHOLD`

29.50 BLM Pedestal Threshold: LTU1 772

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_772_PED_L_THRESHOLD`,
B = `BLM_LTU1_772_PED_H_THRESHOLD`

29.51 BLM Pedestal Thresholds: LTU1 980

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_980_PED_L_THRESHOLD`,
B = `BLM_LTU1_980_PED_H_THRESHOLD`

29.52 BLM Pedestal Thresholds: UND 1021

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1021_PED_L_THRESHOLD`,
B = `BLM_UND1_1021_PED_H_THRESHOLD`

29.53 BLM Pedestal Thresholds: UND 1121

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1121_PED_L_THRESHOLD,
B = BLM_UND1_1121_PED_H_THRESHOLD

29.54 BLM Pedestal Thresholds: UND 120

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_120_PED_L_THRESHOLD,
B = BLM_UND1_120_PED_H_THRESHOLD

29.55 BLM Pedestal Thresholds: UND 121

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_121_PED_L_THRESHOLD,
B = BLM_UND1_121_PED_H_THRESHOLD

29.56 BLM Pedestal Thresholds: UND 1221

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1221_PED_L_THRESHOLD`,
B = `BLM_UND1_1221_PED_H_THRESHOLD`

29.57 BLM Pedestal Thresholds: UND 1321

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1321_PED_L_THRESHOLD`,
B = `BLM_UND1_1321_PED_H_THRESHOLD`

29.58 BLM Pedestal Thresholds: UND 1421

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1421_PED_L_THRESHOLD`,
B = `BLM_UND1_1421_PED_H_THRESHOLD`

29.59 BLM Pedestal Thresholds: UND 1521

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1521_PED_L_THRESHOLD`,
B = `BLM_UND1_1521_PED_H_THRESHOLD`

29.60 BLM Pedestal Thresholds: UND 1621

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1621_PED_L_THRESHOLD`,
B = `BLM_UND1_1621_PED_H_THRESHOLD`

29.61 BLM Pedestal Thresholds: UND 1720

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1720_PED_L_THRESHOLD`,
B = `BLM_UND1_1720_PED_H_THRESHOLD`

29.62 BLM Pedestal Thresholds: UND 1721

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1721_PED_L_THRESHOLD`,
B = `BLM_UND1_1721_PED_H_THRESHOLD`

29.63 BLM Pedestal Thresholds: UND 1821

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1821_PED_L_THRESHOLD`,
B = `BLM_UND1_1821_PED_H_THRESHOLD`

29.64 BLM Pedestal Thresholds: UND 1921

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1921_PED_L_THRESHOLD`,
B = `BLM_UND1_1921_PED_H_THRESHOLD`

29.65 BLM Pedestal Thresholds: UND 2021

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_2021_PED_L_THRESHOLD,
B = BLM_UND1_2021_PED_H_THRESHOLD

29.66 BLM Pedestal Thresholds: UND 2121

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_2121_PED_L_THRESHOLD,
B = BLM_UND1_2121_PED_H_THRESHOLD

29.67 BLM Pedestal Thresholds: UND 221

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_221_PED_L_THRESHOLD,
B = BLM_UND1_221_PED_H_THRESHOLD

29.68 BLM Pedestal Thresholds: UND 2221

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_2220_QBLL_THRESHOLD`,
B = `BLM_2220_QBLH_THRESHOLD`

29.69 BLM Pedestal Thresholds: UND 2321

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_2320_QBLL_THRESHOLD`,
B = `BLM_2320_QBLH_THRESHOLD`

29.70 BLM Pedestal Thresholds: UND 2421

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_2420_QBLL_THRESHOLD`,
B = `BLM_2420_QBLH_THRESHOLD`

29.71 BLM Pedestal Thresholds: UND 2520

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_2520_QBLL_THRESHOLD,
B = BLM_2520_QBLH_THRESHOLD

29.72 BLM Pedestal Thresholds: UND 2521

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_2521_PED_L_THRESHOLD,
B = BLM_UND1_2521_PED_H_THRESHOLD

29.73 BLM Pedestal Thresholds: UND 2621

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_2620_QBLL_THRESHOLD,
B = BLM_2620_QBLH_THRESHOLD

29.74 BLM Pedestal Thresholds: UND 2721

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_2720_QBLL_THRESHOLD,
B = BLM_2720_QBLH_THRESHOLD

29.75 BLM Pedestal Thresholds: UND 2821

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_2820_QBLL_THRESHOLD,
B = BLM_2820_QBLH_THRESHOLD

29.76 BLM Pedestal Thresholds: UND 2921

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_2920_QBLL_THRESHOLD,
B = BLM_2920_QBLH_THRESHOLD

29.77 BLM Pedestal Thresholds: UND 3021

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_3021_PED_L_THRESHOLD`,
B = `BLM_UND1_3021_PED_H_THRESHOLD`

29.78 BLM Pedestal Thresholds: UND 3121

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_3121_PED_L_THRESHOLD`,
B = `BLM_UND1_3121_PED_H_THRESHOLD`

29.79 BLM Pedestal Thresholds: UND 321

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_321_PED_L_THRESHOLD`,
B = `BLM_UND1_321_PED_H_THRESHOLD`

29.80 BLM Pedestal Thresholds: UND 3221

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_3221_PED_L_THRESHOLD`,
B = `BLM_UND1_3221_PED_H_THRESHOLD`

29.81 BLM Pedestal Thresholds: UND 3320

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_3320_PED_L_THRESHOLD`,
B = `BLM_UND1_3320_PED_H_THRESHOLD`

29.82 BLM Pedestal Thresholds: UND 3321

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_3321_PED_L_THRESHOLD`,
B = `BLM_UND1_3321_PED_H_THRESHOLD`

29.83 BLM Pedestal Thresholds: UND 421

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_421_PED_L_THRESHOLD`,
B = `BLM_UND1_421_PED_H_THRESHOLD`

29.84 BLM Pedestal Thresholds: UND 521

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_521_PED_L_THRESHOLD`,
B = `BLM_UND1_521_PED_H_THRESHOLD`

29.85 BLM Pedestal Thresholds: UND 621

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_621_PED_L_THRESHOLD`,
B = `BLM_UND1_621_PED_H_THRESHOLD`

29.86 BLM Pedestal Thresholds: UND 721

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_721_PED_L_THRESHOLD`,
B = `BLM_UND1_721_PED_H_THRESHOLD`

29.87 BLM Pedestal Thresholds: UND 821

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_821_PED_L_THRESHOLD`,
B = `BLM_UND1_821_PED_H_THRESHOLD`

29.88 BLM Pedestal Thresholds: UND 920

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_920_PED_L_THRESHOLD`,
B = `BLM_UND1_920_PED_H_THRESHOLD`

29.89 BLM Pedestal Thresholds: UND 921

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_921_PED_L_THRESHOLD`,
B = `BLM_UND1_921_PED_H_THRESHOLD`

29.90 BLM Pedestal Thresholds: UND BLF1

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_BLF1_PED_L_THRESHOLD`,
B = `BLM_UND1_BLF1_PED_H_THRESHOLD`

29.91 BLM Pedestal Thresholds: UND BLF17

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_BLF17_PED_L_THRESHOLD`,
B = `BLM_UND1_BLF17_PED_H_THRESHOLD`

29.92 BLM PEP Timing Check (LN30)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_722_TEST_L_THRESHOLD`,
B = `BLM_LTU1_722_TEST_H_THRESHOLD`

29.93 BLM PEP Timing Check (LN32)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_762_TEST_L_THRESHOLD`,
B = `BLM_LTU1_762_TEST_H_THRESHOLD`

29.94 BLM PEP Timing Check (LN33)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_621_TEST_L_THRESHOLD`,
B = `BLM_UND1_621_TEST_H_THRESHOLD`

29.95 BLM PEP Timing Check (LN35)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1421_TEST_L_THRESHOLD,
B = BLM_UND1_1421_TEST_H_THRESHOLD

29.96 BLM PEP Timing Check (LN36)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_2220_QTL_THRESHOLD,
B = BLM_2220_QTH_THRESHOLD

29.97 BLM PEP Timing Check (LN37)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_3021_TEST_L_THRESHOLD,
B = BLM_UND1_3021_TEST_H_THRESHOLD

29.98 BLM Raw Charge Thresholds: LTU1 722

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_722_LOSS_L_THRESHOLD`,
B = `BLM_LTU1_722_LOSS_H_THRESHOLD`

29.99 BLM Raw Charge Thresholds: LTU1 732

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_732_LOSS_L_THRESHOLD`,
B = `BLM_LTU1_732_LOSS_H_THRESHOLD`

29.100 BLM Raw Charge Thresholds: LTU1 762

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_762_LOSS_L_THRESHOLD`,
B = `BLM_LTU1_762_LOSS_H_THRESHOLD`

29.101 BLM Raw Charge Thresholds: LTU1 772

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_772_LOSS_L_THRESHOLD`,
B = `BLM_LTU1_772_LOSS_H_THRESHOLD`

29.102 BLM Raw Charge Thresholds: LTU1 980

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_980_LOSS_L_THRESHOLD`,
B = `BLM_LTU1_980_LOSS_H_THRESHOLD`

29.103 BLM Raw Charge Thresholds: UND 1021

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_1021_LOSS_L_THRESHOLD`,
B = `BLM_UND1_1021_LOSS_H_THRESHOLD`

29.104 BLM Raw Charge Thresholds: UND 1121

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1121_LOSS_L_THRESHOLD,
B = BLM_UND1_1121_LOSS_H_THRESHOLD

29.105 BLM Raw Charge Thresholds: UND 120

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_120_LOSS_L_THRESHOLD,
B = BLM_UND1_120_LOSS_H_THRESHOLD

29.106 BLM Raw Charge Thresholds: UND 121

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_121_LOSS_L_THRESHOLD,
B = BLM_UND1_121_LOSS_H_THRESHOLD

29.107 BLM Raw Charge Thresholds: UND 1221

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1221_LOSS_L_THRESHOLD,
B = BLM_UND1_1221_LOSS_H_THRESHOLD

29.108 BLM Raw Charge Thresholds: UND 1321

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1321_LOSS_L_THRESHOLD,
B = BLM_UND1_1321_LOSS_H_THRESHOLD

29.109 BLM Raw Charge Thresholds: UND 1421

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1421_LOSS_L_THRESHOLD,
B = BLM_UND1_1421_LOSS_H_THRESHOLD

29.110 BLM Raw Charge Thresholds: UND 1521

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1521_LOSS_L_THRESHOLD,
B = BLM_UND1_1521_LOSS_H_THRESHOLD

29.111 BLM Raw Charge Thresholds: UND 1621

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1621_LOSS_L_THRESHOLD,
B = BLM_UND1_1621_LOSS_H_THRESHOLD

29.112 BLM Raw Charge Thresholds: UND 1720

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1720_LOSS_L_THRESHOLD,
B = BLM_UND1_1720_LOSS_H_THRESHOLD

29.113 BLM Raw Charge Thresholds: UND 1721

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1721_LOSS_L_THRESHOLD,
B = BLM_UND1_1721_LOSS_H_THRESHOLD

29.114 BLM Raw Charge Thresholds: UND 1821

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1821_LOSS_L_THRESHOLD,
B = BLM_UND1_1821_LOSS_H_THRESHOLD

29.115 BLM Raw Charge Thresholds: UND 1921

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_1921_LOSS_L_THRESHOLD,
B = BLM_UND1_1921_LOSS_H_THRESHOLD

29.116 BLM Raw Charge Thresholds: UND 2021

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_2021_LOSS_L_THRESHOLD,
B = BLM_UND1_2021_LOSS_H_THRESHOLD

29.117 BLM Raw Charge Thresholds: UND 2121

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_2121_LOSS_L_THRESHOLD,
B = BLM_UND1_2121_LOSS_H_THRESHOLD

29.118 BLM Raw Charge Thresholds: UND 221

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_221_LOSS_L_THRESHOLD,
B = BLM_UND1_221_LOSS_H_THRESHOLD

29.119 BLM Raw Charge Thresholds: UND 2221

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_2220_QBL_THRESHOLD`,
B = `BLM_2220_QBH_THRESHOLD`

29.120 BLM Raw Charge Thresholds: UND 2321

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_2320_QBL_THRESHOLD`,
B = `BLM_2320_QBH_THRESHOLD`

29.121 BLM Raw Charge Thresholds: UND 2421

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_2420_QBL_THRESHOLD`,
B = `BLM_2420_QBH_THRESHOLD`

29.122 BLM Raw Charge Thresholds: UND 2520

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_2520_QBL_THRESHOLD,
B = BLM_2520_QBH_THRESHOLD

29.123 BLM Raw Charge Thresholds: UND 2521

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_2521_LOSS_L_THRESHOLD,
B = BLM_UND1_2521_LOSS_H_THRESHOLD

29.124 BLM Raw Charge Thresholds: UND 2621

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_2620_QBL_THRESHOLD,
B = BLM_2620_QBH_THRESHOLD

29.125 BLM Raw Charge Thresholds: UND 2721

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_2720_QBL_THRESHOLD`,
B = `BLM_2720_QBH_THRESHOLD`

29.126 BLM Raw Charge Thresholds: UND 2821

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_2820_QBL_THRESHOLD`,
B = `BLM_2820_QBH_THRESHOLD`

29.127 BLM Raw Charge Thresholds: UND 2921

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_2920_QBL_THRESHOLD`,
B = `BLM_2920_QBH_THRESHOLD`

29.128 BLM Raw Charge Thresholds: UND 3021

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_3021_LOSS_L_THRESHOLD,
B = BLM_UND1_3021_LOSS_H_THRESHOLD

29.129 BLM Raw Charge Thresholds: UND 3121

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_3121_LOSS_L_THRESHOLD,
B = BLM_UND1_3121_LOSS_H_THRESHOLD

29.130 BLM Raw Charge Thresholds: UND 321

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_321_LOSS_L_THRESHOLD,
B = BLM_UND1_321_LOSS_H_THRESHOLD

29.131 BLM Raw Charge Thresholds: UND 3221

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_3221_LOSS_L_THRESHOLD,
B = BLM_UND1_3221_LOSS_H_THRESHOLD

29.132 BLM Raw Charge Thresholds: UND 3320

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_3320_LOSS_L_THRESHOLD,
B = BLM_UND1_3320_LOSS_H_THRESHOLD

29.133 BLM Raw Charge Thresholds: UND 3321

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_3321_LOSS_L_THRESHOLD,
B = BLM_UND1_3321_LOSS_H_THRESHOLD

29.134 BLM Raw Charge Thresholds: UND 421

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_421_LOSS_L_THRESHOLD`,
B = `BLM_UND1_421_LOSS_H_THRESHOLD`

29.135 BLM Raw Charge Thresholds: UND 521

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_521_LOSS_L_THRESHOLD`,
B = `BLM_UND1_521_LOSS_H_THRESHOLD`

29.136 BLM Raw Charge Thresholds: UND 621

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_621_LOSS_L_THRESHOLD`,
B = `BLM_UND1_621_LOSS_H_THRESHOLD`

29.137 BLM Raw Charge Thresholds: UND 721

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_721_LOSS_L_THRESHOLD,
B = BLM_UND1_721_LOSS_H_THRESHOLD

29.138 BLM Raw Charge Thresholds: UND 821

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_821_LOSS_L_THRESHOLD,
B = BLM_UND1_821_LOSS_H_THRESHOLD

29.139 BLM Raw Charge Thresholds: UND 920

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_920_LOSS_L_THRESHOLD,
B = BLM_UND1_920_LOSS_H_THRESHOLD

29.140 BLM Raw Charge Thresholds: UND 921

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_921_LOSS_L_THRESHOLD`,
B = `BLM_UND1_921_LOSS_H_THRESHOLD`

29.141 BLM Raw Charge Thresholds: UND BLF1

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_BLF1_LOSS_L_THRESHOLD`,
B = `BLM_UND1_BLF1_LOSS_H_THRESHOLD`

29.142 BLM Raw Charge Thresholds: UND BLF17

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_BLF17_LOSS_L_THRESHOLD`,
B = `BLM_UND1_BLF17_LOSS_H_THRESHOLD`

29.143 BLM Timing Check (BLM:UND1:4)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Bad Timing	F	F	0 Hz	0 Hz	0 Hz	–
Bad Timing High	F	T	0 Hz	0 Hz	0 Hz	–
Bad Timing Low	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_4_TIMING_L_THRESHOLD`,
B = `BLM_UND1_4_TIMING_H_THRESHOLD`

29.144 BLM Timing Check (LN30)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Bad Timing	F	F	0 Hz	0 Hz	0 Hz	–
Bad Timing High	F	T	0 Hz	0 Hz	0 Hz	–
Bad Timing Low	T	F	0 Hz	0 Hz	0 Hz	–
All OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_UND1_4_TIMING_L_THRESHOLD`,
B = `BLM_UND1_4_TIMING_H_THRESHOLD`

29.145 BLM Trigger Missed (LN30)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BLM_LTU1_722_NO_TRIG_MISSED`

29.146 BLM Trigger Missed (LN32)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_LTU1_762_NO_TRIG_MISSED

29.147 BLM Trigger Missed (LN33)

Name	A	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_6_NO_TRIG_MISSED

29.148 BLM Trigger Missed (LN35)

Name	A	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_14_NO_TRIG_MISSED

29.149 BLM Trigger Missed (LN36)

Name	A	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_TRIG_MISSED

29.150 BLM Trigger Missed (LN37)

Name	A	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = BLM_UND1_30_NO_TRIG_MISSED

29.151 BLM/PIC Watchdog: Downstream of TDUND

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_MCC0_2_PICBLM_WD_STATUS`

29.152 BPM Summary (1-9)

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `IOC_UND1_BP01_MPSSTAT_STATE`

29.153 BPM Summary (10-18)

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `IOC_UND1_BP02_MPSSTAT_STATE`

29.154 BPM Summary (19-27)

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `IOC_UND1_BP03_MPSSTAT_STATE`

29.155 BPM Summary (28-36)

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = IOC_UND1_BP04_MPSSTAT_STATE

29.156 OTR01 IN20 541 Position and TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = OTRS_IN20_541_OUT_LMTSW_STATE,
B = OTRS_IN20_541_IN_LMTSW_STATE

29.157 OTR02 IN20 571 Position and TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = OTRS_IN20_571_OUT_LMTSW_STATE,
B = OTRS_IN20_571_IN_LMTSW_STATE

29.158 OTR03 IN20 621 Position and TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = OTRS_IN20_621_OUT_LMTSW_STATE,
B = OTRS_IN20_621_IN_LMTSW_STATE

29.159 OTR04 IN20 711 Position and TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = OTRS_IN20_711_OUT_LMTSW_STATE,
B = OTRS_IN20_711_IN_LMTSW_STATE

29.160 OTR11 LI21 237 Position and TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = OTRS_LI21_237_OUT_LMTSW_STATE,
B = OTRS_LI21_237_IN_LMTSW_STATE

29.161 OTR12 LI21 291 Position and TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = OTRS_LI21_291_OUT_LMTSW_STATE,
B = OTRS_LI21_291_IN_LMTSW_STATE

29.162 OTR21 Position When TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = OTRS_LI24_807_OUT_LMTSW_STATE,
B = OTRS_LI24_807_IN_LMTSW_STATE

29.163 OTR22 Position When TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = OTRS_LI25_342_OUT_LMTSW_STATE,
B = OTRS_LI25_342_IN_LMTSW_STATE

29.164 OTRH1 Position When TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRH1_OUT_LIMIT_STATE`,
B = `OTRH1_IN_LIMIT_STATE`

29.165 OTRH2 Position When TDUND Not In

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	0 Hz	0 Hz	0 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRH2_OUT_LIMIT_STATE`,
B = `OTRH2_IN_LIMIT_STATE`

29.166 PIC HVPS B921 - Location B921-2235

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_DMP1_B921_HV_PWR_STATE`

29.167 PIC Trigger Missed (LN34)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICS_DMP1_100_NO_TRIG_MISSED

29.168 THz Radiator Beryllium Foil

Name	B	A	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = THZR_DMP1_350_OUT_LIMIT_POSITION,
B = THZR_DMP1_350_IN_LIMIT_POSITION

29.169 Toroid Comparator Dump (IMUNDO vs IMDUMP)

Name	B	A	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
3E8 ppb Gain	F	T	0 Hz	0 Hz	0 Hz	–
3E8 ppb Loss	T	F	0 Hz	0 Hz	0 Hz	–
Under 3E8 ppb Loss	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = IMUNDO_COMP_L1_STATE,
B = IMUNDO_COMP_L2_STATE

29.170 Toroid Comparator Power Status (B921)

Name	A	PC	MS	BYKIK	LHS
Powered Off	F	0 Hz	0 Hz	0 Hz	–
Powered On	T	120 Hz	120 Hz	120 Hz	–

Where
A = COMP_STAT_ON_STATE

29.171 Toroid Comparator Undulator (IMUNDI vs IMUNDO)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
3E8 ppb Gain	F	T	0 Hz	0 Hz	0 Hz	–
3E8 ppb Loss	T	F	0 Hz	0 Hz	0 Hz	–
Under 3E8 ppb Loss	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `IMUNDI_COMP_L1_STATE`,
B = `IMUNDI_COMP_L2_STATE`

30 Ignored when TD11 Is In, YAG01 Is In, or YAG02 Is In

30.1 BLM/PIC Watchdog BSY0/BSYA

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
Ok	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_BSY0_1_PICBLM_WD_STATUS`

30.2 BLM/PIC Watchdog LI24

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
Ok	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_LI24_1_PICBLM_WD_STATUS`

30.3 BLM/PIC Watchdog LI30

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
Ok	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_LI30_1_PICBLM_WD_STATUS`

30.4 Bunch Length Monitor BL21 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BL22_OUT_STATE`,
B = `BL22_IN_STATE`

30.5 Flowswitch: BSY RAD LCW Slit 10/30

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
Ok	T	120 Hz	120 Hz	120 Hz	–

Where
A = `HTEXCH2_STATE`

30.6 Flowswitch: CE21

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `COL_805_FLOSW_STATE`

30.7 Flowswitch: COLL BSYH 479 (PCAPM1)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `COLL_BSYH_479_FLOW_SW_STATE`

30.8 Flowswitch: COLL BSYH 487 (PCAPM2)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = COLL_BSYH_487_FLOW_SW_STATE

30.9 Flowswitch: COLL BSYH 495 (PCAPM3)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = COLL_BSYH_495_FLOW_SW_STATE

30.10 Flowswitch: COLL BSYH 503 (PCAPM4)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = COLL_BSYH_503_FLOW_SW_STATE

30.11 Flowswitch: COLL BSYH 520 (PCBSYH/A)

Name	*A*	PC	MS	BYKIK	LHS
FAULT	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = COLL_BSYH_520_FLOW_SW_STATE

30.12 Hydrogen Recombiner For BSY 1 Collimator

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
Ok	T	120 Hz	120 Hz	120 Hz	–

Where
A = HYDRECM1_STATE

30.13 Hydrogen Recombiner For BSY 2 Slit 10/30

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
Ok	T	120 Hz	120 Hz	120 Hz	–

Where
A = HYDRECM2_STATE

30.14 KICK BSY0 66 PM1 State (A-Line Kicker)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Inconsistent	F	F	0 Hz	0 Hz	0 Hz	–
Is_OFF	F	T	120 Hz	120 Hz	120 Hz	–
Is_ON	T	F	120 Hz	120 Hz	120 Hz	–
Inconsistent	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = KICK_BSY0_66_PM1_OFF_STATUS,
B = KICK_BSY0_66_PM1_ON_STATUS

30.15 KICK BSY0 66 PM1 Trigger State (A-Line Kicker)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Inconsistent	F	F	0 Hz	0 Hz	0 Hz	–
Is_Triggered	F	T	120 Hz	120 Hz	120 Hz	–
Is_Trig_Disabled	T	F	120 Hz	120 Hz	120 Hz	–
Inconsistent	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = KICK_BSY0_66_PM1_TRIG_ENB_STATUS,
B = KICK_BSY0_66_PM1_TRIG_LOCK_STATUS

30.16 KICK BSY0 66 PM2 State (A-Line Kicker)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Inconsistent	F	F	0 Hz	0 Hz	0 Hz	–
Is_OFF	F	T	120 Hz	120 Hz	120 Hz	–
Is_ON	T	F	120 Hz	120 Hz	120 Hz	–
Inconsistent	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = KICK_BSY0_66_PM2_OFF_STATUS,
B = KICK_BSY0_66_PM2_ON_STATUS

30.17 KICK BSY0 66 PM2 Trigger State (A-Line Kicker)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Inconsistent	F	F	0 Hz	0 Hz	0 Hz	–
Is_Triggered	F	T	120 Hz	120 Hz	120 Hz	–
Is_Trig_Disabled	T	F	120 Hz	120 Hz	120 Hz	–
Inconsistent	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = KICK_BSY0_66_PM2_TRIG_ENB_STATUS,
B = KICK_BSY0_66_PM2_TRIG_LOCK_STATUS

30.18 OTR21 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRS_LI24_807_OUT_LMTSW_STATE`,
B = `OTRS_LI24_807_IN_LMTSW_STATE`

30.19 OTR22 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRS_LI25_342_OUT_LMTSW_STATE`,
B = `OTRS_LI25_342_IN_LMTSW_STATE`

30.20 PIC Gas Pressure LI24

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PIC_GAS_PRESS_STATE`

30.21 PIC HVPS B911 - Location B911-2135

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LTU1_B911_HV_PWR_STATE

30.22 PIC HVPS B912 - Location B912-2135

Name	A	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LTU1_B912_HV_PWR_STATE

30.23 PIC HVPS B913 - Location B913-2135

Name	A	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LTU1_B913_HV_PWR_STATE

30.24 PIC HVPS BSY 1 - Location B005-3921

Name	A	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSY0_1_HV_PWR_STATE

30.25 PIC HVPS BSY 2 - Location B005-3921

Name	A	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSY0_2_HV_PWR_STATE

30.26 PIC HVPS BSY 3 - Location B005-3921

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSY0_3_HV_PWR_STATE`

30.27 PIC HVPS BSY 4 - Location B005-3918

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSY0_4_HV_PWR_STATE`

30.28 PIC HVPS BSY 5 - Location B005-3918

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSY0_5_HV_PWR_STATE`

30.29 PIC HVPS BSY 6 - Location B005-3918

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_BSY0_6_HV_PWR_STATE`

30.30 PIC HVPS LI24 - Location LKF24-0235

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LI24_1_HV_PWR_STATE

30.31 PIC Raw Charge Thresholds: BSYH 479 (PCAPM1)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSYH_479_LOSSL_THRESHOLD,
B = PICM_BSYH_479_LOSSH_THRESHOLD

30.32 PIC Raw Charge Thresholds: BSYH 487 (PCAPM2)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSYH_487_LOSSL_THRESHOLD,
B = PICM_BSYH_487_LOSSH_THRESHOLD

30.33 PIC Raw Charge Thresholds: BSYH 495 (PCAPM3)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSYH_495_LOSSL_THRESHOLD,
B = PICM_BSYH_495_LOSSH_THRESHOLD

30.34 PIC Raw Charge Thresholds: BSYH 503 (PCAPM4)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSYH_503_LOSSL_THRESHOLD,
B = PICM_BSYH_503_LOSSH_THRESHOLD

30.35 PIC Raw Charge Thresholds: BSYH 520 PCBSYH/A

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSYH_520_LOSSL_THRESHOLD,
B = PICM_BSYH_520_LOSSH_THRESHOLD

30.36 PIC Raw Charge Thresholds: BSYH 762 PC90

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSYH_762_LOSSL_THRESHOLD,
B = PICM_BSYH_762_LOSSH_THRESHOLD

30.37 PIC Raw Charge Thresholds: BSYH 836 PC119

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSYH_836_LOSSL_THRESHOLD,
B = PICM_BSYH_836_LOSSH_THRESHOLD

30.38 PIC Raw Charge Thresholds: LTU1 220

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICS_LTU1_220_LOSSL_THRESHOLD,
B = PICS_LTU1_220_LOSSH_THRESHOLD

30.39 PIC Raw Charge Thresholds: LTU1 252

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICS_LTU1_252_LOSSL_THRESHOLD,
B = PICS_LTU1_252_LOSSH_THRESHOLD

30.40 PIC Raw Charge Thresholds: LTU1 280

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICS_LTU1_280_LOSSL_THRESHOLD,
B = PICS_LTU1_280_LOSSH_THRESHOLD

30.41 PIC Raw Charge Thresholds: LTU1 420

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICS_LTU1_420_LOSSL_THRESHOLD,
B = PICS_LTU1_420_LOSSH_THRESHOLD

30.42 PIC Raw Charge Thresholds: LTU1 450

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICS_LTU1_450_LOSSL_THRESHOLD,
B = PICS_LTU1_450_LOSSH_THRESHOLD

30.43 PIC Raw Charge Thresholds: LTU1 480

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICS_LTU1_480_LOSSL_THRESHOLD,
B = PICS_LTU1_480_LOSSH_THRESHOLD

30.44 PIC Raw Charge Thresholds: LTU1 722

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICS_LTU1_722_LOSSL_THRESHOLD,
B = PICS_LTU1_722_LOSSH_THRESHOLD

30.45 PIC Raw Charge Thresholds: LTU1 732

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LTU1_732_LOSSL_THRESHOLD,
B = PICM_LTU1_732_LOSSH_THRESHOLD

30.46 PIC Raw Charge Thresholds: LTU1 762

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICS_LTU1_762_LOSSL_THRESHOLD,
B = PICS_LTU1_762_LOSSH_THRESHOLD

30.47 PIC Raw Charge Thresholds: LTU1 772

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICS_LTU1_772_LOSSL_THRESHOLD,
B = PICS_LTU1_772_LOSSH_THRESHOLD

30.48 PIC Trigger Missed (LN28)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICS_LTU1_220_NO_TRIG_MISSED`

30.49 PIC Trigger Missed (LN29)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICS_LTU1_480_NO_TRIG_MISSED`

30.50 PIC Trigger Missed (LN31)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICS_LTU1_762_NO_TRIG_MISSED`

30.51 Stopper: BSY D2, 60, 61 DM60 Summary

The following code assigns the truth table's state number to the `unsigned int` variable `state`.

```
/*
 * state = 0 : full rate (120 Hz) beam allowed, ALL OUT
 * state = 1 : full rate (120 Hz) beam allowed, ALL IN
 * state = 2 : do not allow beam, Moving or Inconsistant
*/

/* Initialize to a guard value */
state = (unsigned int) -1;
```

```
/*
 * Stopper: BSY D2, 60, 61 DM60 Summary
 * Status given from PPS Stopper chassis very close to limit switches
    and CNTRL and passed to MPS via
 * opto's to insure fasts possible response. BTM60 has been documented
    to move at 200 msec from OUT to IN
 * Allow beam if ALL OUT
 * Allow beam if ALL IN
 * Otherwise, do not allow beam, Moving or Inconsistant
 */


/* Input Descriptions
*    INPUT_NAME                                                    ,
   FAULT_NAME (low)      , OK_NAME           , DESC
*       STPR_BSY0_89_IN_LIMSW_A_POSITION          , "IS_NOT_IN"
              , "IS_IN"      , "ST60 IN LIMSW CHAN A"
*       STPR_BSY0_89_IN_LIMSW_B_POSITION          , "IS_NOT_IN"
              , "IS_IN"      , "ST60 IN LIMSW CHAN B"
*       STPR_BSY0_89_OUT_LIMSW_A_POSITION         , "IS_NOT_OUT"
             , "IS_OUT"     , "ST60 OUT LIMSW CHAN A"
*       STPR_BSY0_89_OUT_LIMSW_B_POSITION         , "IS_NOT_OUT"
             , "IS_OUT"     , "ST60 OUT LIMSW CHAN B"
*       STPR_BSY0_90_IN_LIMSW_A_POSITION          , "IS_NOT_IN"
              , "IS_IN"      , "ST61 IN LIMSW CHAN A"
*       STPR_BSY0_90_IN_LIMSW_B_POSITION          , "IS_NOT_IN"
              , "IS_IN"      , "ST61 IN LIMSW CHAN B"
*       STPR_BSY0_90_OUT_LIMSW_A_POSITION         , "IS_NOT_OUT"
             , "IS_OUT"     , "ST61 OUT LIMSW CHAN A"
*       STPR_BSY0_90_OUT_LIMSW_B_POSITION         , "IS_NOT_OUT"
             , "IS_OUT"     , "ST61 OUT LIMSW CHAN B"
*       STPR_BSY0_88_IN_LIMSW_A_POSITION          , "IS_NOT_IN"
              , "IS_IN"      , "D2 IN LIMSW CHAN A"
*       STPR_BSY0_88_IN_LIMSW_B_POSITION          , "IS_NOT_IN"
              , "IS_IN"      , "D2 IN LIMSW CHAN B"
*       STPR_BSY0_88_OUT_LIMSW_A_POSITION         , "IS_NOT_OUT"
             , "IS_OUT"     , "D2 OUT LIMSW CHAN A"
*       BTM_BSY0_89_IN_LIMSW_A_POSITION           , "IS_NOT_IN"
              , "IS_IN"      , "BTM60 IN LIMSW CHAN A"
*       BTM_BSY0_89_IN_LIMSW_B_POSITION       , "IS_NOT_IN"         , "
   IS_IN"       , "BTM60 IN LIMSW CHAN B"
*       BTM_BSY0_89_OUT_LIMSW_A_POSITION          , "IS_NOT_OUT"
             , "IS_OUT"     , "BTM60 OUT LIMSW CHAN A"
*       BTM_BSY0_89_OUT_CNTRL_A_PPS_CNTRL         , "IS_NOT_OUT_RQ"
```

```
          , "IS_OUT_RQ" , "BTM60 OUT SOLN CNTRL CHAN A"
*         BTM_BSY0_89_OUT_CNTRL_B_PPS_CNTRL          , "IS_NOT_OUT_RQ"
          , "IS_OUT_RQ" , "BTM60 OUT SOLN CNTRL CHAN B2"
*
*/

if ( STPR_BSY0_89_OUT_LIMSW_A_POSITION &&
    STPR_BSY0_89_OUT_LIMSW_B_POSITION &&
            STPR_BSY0_90_OUT_LIMSW_A_POSITION &&
                STPR_BSY0_90_OUT_LIMSW_B_POSITION &&
            STPR_BSY0_88_OUT_LIMSW_A_POSITION &&
                BTM_BSY0_89_OUT_LIMSW_A_POSITION &&
            BTM_BSY0_89_OUT_CNTRL_A_PPS_CNTRL &&
                BTM_BSY0_89_OUT_CNTRL_B_PPS_CNTRL &&
            !( STPR_BSY0_89_IN_LIMSW_A_POSITION ||
                STPR_BSY0_89_IN_LIMSW_B_POSITION ||
                STPR_BSY0_90_IN_LIMSW_A_POSITION ||
                    STPR_BSY0_90_IN_LIMSW_B_POSITION ||
                STPR_BSY0_88_IN_LIMSW_A_POSITION ||
                    STPR_BSY0_88_IN_LIMSW_B_POSITION ||
                BTM_BSY0_89_IN_LIMSW_A_POSITION ||
                    BTM_BSY0_89_IN_LIMSW_B_POSITION ) )
{
    state = 0; /* ALL OUT, and NOT IN, okay to run beam */
}

else if ( STPR_BSY0_89_IN_LIMSW_A_POSITION  &&
    STPR_BSY0_89_IN_LIMSW_B_POSITION &&
            STPR_BSY0_90_IN_LIMSW_A_POSITION &&
                STPR_BSY0_90_IN_LIMSW_B_POSITION &&
            STPR_BSY0_88_IN_LIMSW_A_POSITION &&
                STPR_BSY0_88_IN_LIMSW_B_POSITION &&
            BTM_BSY0_89_IN_LIMSW_A_POSITION &&
                BTM_BSY0_89_IN_LIMSW_B_POSITION  &&
            !(STPR_BSY0_89_OUT_LIMSW_A_POSITION ||
                STPR_BSY0_89_OUT_LIMSW_B_POSITION ||
              STPR_BSY0_90_OUT_LIMSW_A_POSITION ||
                  STPR_BSY0_90_OUT_LIMSW_B_POSITION ||
              STPR_BSY0_88_OUT_LIMSW_A_POSITION ||
                  BTM_BSY0_89_OUT_LIMSW_A_POSITION  ||
              BTM_BSY0_89_OUT_CNTRL_A_PPS_CNTRL ||
                  BTM_BSY0_89_OUT_CNTRL_B_PPS_CNTRL ) )
{
    state = 1; /* ALL IN and NOT OUT okay to run beam */
}
```

```
else
{
    state = 2; /* do not allow beam, Moving or Inconsistent */
}
```

Name	State	PC	MS	BYKIK	LHS
IS_OUT	0	120 Hz	120 Hz	120 Hz	–
IS_IN	1	10 Hz	10 Hz	10 Hz	–
Moving or Inconsistent	2	0 Hz	0 Hz	0 Hz	–

30.52 Temperature RTD Summary: BSY Common Line

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `RTD_BSY0_16_CLINESUM_STATUS`

30.53 Toroid Chassis LI24 IMBC2

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `CHASIMB2_STATE`

30.54 Toroid Comparator BC2 (IMBC2IN vs IMBC2OUT)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Downstream > Upstream	F	T	0 Hz	0 Hz	0 Hz	–
Upstream > Downstream	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = TCBC2L1_STATE,
B = TCBC2L2_STATE

30.55 VVFS CLTH 101 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVFS_CLTH_101_OPEN_LIMSW_POSITION

30.56 VVPG BSYH 470 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_BSYH_470_OPEN_LIMSW_POSITION

30.57 VVPG BSYH 541 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_BSYH_541_OPEN_LIMSW_POSITION

30.58 VVPG BSYH 837 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VVPG_BSYH_837_OPEN_LIMSW_POSITION`

30.59 VVPG CLTH 178 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VVPG_CLTH_178_OPEN_LIMSW_POSITION`

30.60 VVPG CLTH 375 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VVPG_CLTH_375_OPEN_LIMSW_POSITION`

31 Ignored when YAG01 Is In

31.1 BXG Status

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Off	F	T	120 Hz	120 Hz	120 Hz	–
On	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = BEND_IN20_231_OFF_STATE,
B = BEND_IN20_231_OK_STATE

31.2 Toroid Peak Current Monitor IM01

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = TR_BL215_STATE

31.3 YAG02 IN20 241 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = YAGS_IN20_241_OUT_LMTSW_STATE,
B = YAGS_IN20_241_IN_LMTSW_STATE

32 Ignored when YAG01 Is In or YAG02 Is In

32.1 BLM/PIC Watchdog: Upstream of TDUND

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_MCC0_1_PICBLM_WD_STATUS`

32.2 BX01/BX02 Status

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Off	F	T	120 Hz	120 Hz	120 Hz	–
On	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `BEND_IN20_751_OFF_STATE`,
B = `BEND_IN20_751_OK_STATE`

32.3 Dump LI28 5879 Flowswitch

Name	*A*	PC	MS	BYKIK	LHS
No Flow	F	0 Hz	0 Hz	0 Hz	–
Flow OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `DUMP_5879_FLOW_SW_STATE`

32.4 Dump LI28 5879 Klixon

Name	*A*	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = DUMP_5879_KLIXON_OK_STATE

32.5 Flowswitch: CE11

Name	A	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = COLL_LI21_235_OPEN_STATE

32.6 Flowswitch: COLL LI28-9

Name	A	PC	MS	BYKIK	LHS
No Flow	F	0 Hz	0 Hz	0 Hz	–
Flow OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = FLOW_SW_28_9_STATE

32.7 Flowswitch: COLL LI29-1

Name	A	PC	MS	BYKIK	LHS
No Flow	F	0 Hz	0 Hz	0 Hz	–
Flow OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = FLOW_SW_29_1_STATE

32.8 Flowswitch: COLL LI29-4

Name	A	PC	MS	BYKIK	LHS
No Flow	F	0 Hz	0 Hz	0 Hz	–
Flow OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = FLOW_SW_29_4_STATE

32.9 Flowswitch: COLL LI29-5

Name	*A*	PC	MS	BYKIK	LHS
No Flow	F	0 Hz	0 Hz	0 Hz	–
Flow OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = FLOW_SW_29_5_STATE

32.10 Flowswitch: COLL LI29-9

Name	*A*	PC	MS	BYKIK	LHS
No Flow	F	0 Hz	0 Hz	0 Hz	–
Flow OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = FLOW_SW_29_9_STATE

32.11 Flowswitch: COLL LI30-1

Name	*A*	PC	MS	BYKIK	LHS
No Flow	F	0 Hz	0 Hz	0 Hz	–
Flow OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = FLOW_SW_30_1_STATE

32.12 Flowswitch: COLL LI30-4

Name	*A*	PC	MS	BYKIK	LHS
No Flow	F	0 Hz	0 Hz	0 Hz	–
Flow OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = FLOW_SW_30_4_STATE

32.13 Flowswitch: COLL LI30-5

Name	*A*	PC	MS	BYKIK	LHS
No Flow	F	0 Hz	0 Hz	0 Hz	–
Flow OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `FLOW_SW_30_5_STATE`

32.14 Flowswitch: TD11

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `FS_BL305_STATE`

32.15 Main Manifold Gauge: LI21 Station 5

Name	*A*	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_MM_GAUGE_OK_LI21_STATE`

32.16 Main Manifold Gauge: LI22 Station 5

Name	*A*	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_MM_GAUGE_OK_LI22_STATE`

32.17 Main Manifold Gauge: LI23 Station 5

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_MM_GAUGE_OK_LI23_STATE`

32.18 Main Manifold Gauge: LI24 Station 5

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_MM_GAUGE_OK_LI24_STATE`

32.19 Main Manifold Gauge: LI25 Station 5

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_MM_GAUGE_OK_LI25_STATE`

32.20 Main Manifold Gauge: LI26 Station 5

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_MM_GAUGE_OK_LI26_STATE`

32.21 Main Manifold Gauge: LI27 Station 5

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_MM_GAUGE_OK_LI27_STATE

32.22 Main Manifold Gauge: LI28 Station 5

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_MM_GAUGE_OK_LI28_STATE

32.23 Main Manifold Gauge: LI29 Station 5

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_MM_GAUGE_OK_STATE

32.24 Main Manifold Gauge: LI30 Station 5

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_MM_GAUGE_30_5_OK_STATE

32.25 Main Manifold Gauge: LI30 Station 9

Name	*A*	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_MM_GAUGE_30_9_OK_STATE`

32.26 Mirror BL11 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	120 Hz	120 Hz	120 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `MIR_BL11_OUT_STATE`,
B = `MIR_BL11_IN_STATE`

32.27 OTR LI25 920 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTR_TCAV_OUT_STATE`,
B = `OTR_TCAV_IN_STATE`

32.28 OTR01 IN20 541 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRS_IN20_541_OUT_LMTSW_STATE`,
B = `OTRS_IN20_541_IN_LMTSW_STATE`

32.29 OTR02 IN20 571 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRS_IN20_571_OUT_LMTSW_STATE`,
B = `OTRS_IN20_571_IN_LMTSW_STATE`

32.30 OTR03 IN20 621 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRS_IN20_621_OUT_LMTSW_STATE`,
B = `OTRS_IN20_621_IN_LMTSW_STATE`

32.31 OTR04 IN20 711 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRS_IN20_711_OUT_LMTSW_STATE`,
B = `OTRS_IN20_711_IN_LMTSW_STATE`

32.32 OTR11 LI21 237 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRS_LI21_237_OUT_LMTSW_STATE`,
B = `OTRS_LI21_237_IN_LMTSW_STATE`

32.33 OTR12 LI21 291 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRS_LI21_291_OUT_LMTSW_STATE`,
B = `OTRS_LI21_291_IN_LMTSW_STATE`

32.34 OTRH1 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRH1_OUT_LIMIT_STATE`,
B = `OTRH1_IN_LIMIT_STATE`

32.35 OTRH2 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `OTRH2_OUT_LIMIT_STATE`,
B = `OTRH2_IN_LIMIT_STATE`

32.36 PIC HVPS LI30 - KG30-C1322

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_LI30_1_HV_PWR_STATE`

32.37 PIC Raw Charge Thresholds: LI24 791

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LI24_791_LOSSL_THRESHOLD,
B = PICM_LI24_791_LOSSH_THRESHOLD

32.38 PIC Raw Charge Thresholds: LI24 811

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LI24_811_LOSSL_THRESHOLD,
B = PICM_LI24_811_LOSSH_THRESHOLD

32.39 PIC Trigger Missed (LN16)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LI24_791_NO_TRIG_MISSED

32.40 Scraper Water LI21-9 (Station 22-1)

Name	*A*	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_SCRAPPER_FLOW_OK_LI22_STATE

32.41 Scraper Water LI22-9 (Station 23-1)

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_SCRAPPER_FLOW_OK_LI23_STATE

32.42 Scraper Water LI23-9 (Station 24-1)

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_SCRAPPER_FLOW_OK_LI24_STATE

32.43 Scraper Water LI24-9 (Station 25-1)

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_SCRAPPER_FLOW_OK_LI25_STATE

32.44 Scraper Water LI25-9 (Station 26-1)

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_SCRAPPER_FLOW_OK_LI26_STATE

32.45 Scraper Water LI26-9 (Station 27-1)

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_SCRAPPER_FLOW_OK_LI27_STATE

32.46 Scraper Water LI27-9 (Station 28-1)

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_SCRAPPER_FLOW_OK_LI28_STATE

32.47 Scraper Water LI28-9 (Station 29-1)

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_SCRAPPER_FLOW_OK_LI29_STATE

32.48 Scraper Water LI29-9 (Station 30-1)

Name	A	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = MPS_SCRAPPER_FLOW_OK_LI30_STATE

32.49 Stopper LI28 950 and 960 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `BASII_STOPPER_OUT_STATE`

32.50 Sub-booster Ready: LI21

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_SBST_OK_READY_LI21_STATE`

32.51 Sub-booster Ready: LI22

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_SBST_OK_READY_LI22_STATE`

32.52 Sub-booster Ready: LI25

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_SBST_OK_READY_LI25_STATE`

32.53 Sub-booster Ready: LI26

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_SBST_OK_READY_LI26_STATE`

32.54 Sub-booster Ready: LI27

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_SBST_OK_READY_LI27_STATE`

32.55 Sub-booster Ready: LI28

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_SBST_OK_READY_LI28_STATE`

32.56 Sub-booster Ready: LI29

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_SBST_OK_READY_LI29_STATE`

32.57 Sub-booster Ready: LI30

Name	*A*	PC	MS	BYKIK	LHS
Not Ready	F	0 Hz	0 Hz	0 Hz	–
Ready	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_SBST_OK_READY_LI30_STATE`

32.58 TD11 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	–	–
Out	F	T	120 Hz	120 Hz	–	–
In	T	F	120 Hz	120 Hz	–	–
Broken	T	T	0 Hz	0 Hz	–	–

Where
A = `TD11_OUT_LIMIT_STATE`,
B = `TD11_IN_LIMIT_STATE`

32.59 Toroid Chassis IN20 IM11

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `CHASIM11_STATE`

32.60 Toroid Chassis IN20 IM12

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `CHASIM12_STATE`

32.61 Toroid Comparator BC1 (IMBC1IN vs IMBC1OUT)

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Downstream - Upstream > 50 pC	F	T	0 Hz	0 Hz	0 Hz	–
Upstream - Downstream > 200 pC	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `TCBC1L1_STATE`,
B = `TCBC1L2_STATE`

32.62 VVFS LI21-9 Position (Station 22-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `FAST_VLV_OPEN_LI22_STATE`

32.63 VVFS LI22-9 Position (Station 23-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `FAST_VLV_OPEN_LI23_STATE`

32.64 VVFS LI23-9 Position (Station 24-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = `FAST_VLV_OPEN_LI24_STATE`

32.65 VVFS LI24-9 Position (Station 25-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = FAST_VLV_OPEN_LI25_STATE

32.66 VVFS LI25-9 Position (Station 26-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = FAST_VLV_OPEN_LI26_STATE

32.67 VVFS LI26-9 Position (Station 27-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = FAST_VLV_OPEN_LI27_STATE

32.68 VVFS LI27-9 Position (Station 28-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = FAST_VLV_OPEN_LI28_STATE

32.69 VVFS LI28-9 Position (Station 29-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = FAST_VLV_OPEN_LI29_STATE

32.70 VVFS LI29-9 Position (Station 30-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = FAST_VLV_OPEN_LI30_STATE

32.71 VVFV IN20 785 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVFV_IN20_785_OPEN_LMTSW_POSITION

32.72 VVMG LI21 195 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VV_BL195_STATE

32.73 VVMG LTU1 505 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVPG_0505_STATE

32.74 VVPG IN20 435 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VV_BL435_STATE

32.75 VVPG IN20 545 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VV_BL545_STATE

32.76 VVPG IN20 635 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VV_BL635_STATE

32.77 VVPG IN20 915 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VV_IS915_STATE

32.78 VVPG LI21-9 Position (Station 22-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = SLOW_VLV_OPEN_LI22_STATE

32.79 VVPG LI22-9 Position (Station 23-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = SLOW_VLV_OPEN_LI23_STATE

32.80 VVPG LI23-9 Position (Station 24-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = SLOW_VLV_OPEN_LI24_STATE

32.81 VVPG LI24 710 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VV21_STATE

32.82 VVPG LI24 896 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = VV22_STATE

32.83 VVPG LI25-9 Position (Station 26-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = SLOW_VLV_OPEN_LI26_STATE

32.84 VVPG LI26-9 Position (Station 27-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = SLOW_VLV_OPEN_LI27_STATE

32.85 VVPG LI27-9 Position (Station 28-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = SLOW_VLV_OPEN_LI28_STATE

32.86 VVPG LI28-9 Position (Station 29-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = SLOW_VLV_OPEN_LI29_STATE

32.87 VVPG LI29-9 Position (Station 30-1)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = SLOW_VLV_OPEN_LI30_STATE

32.88 VVPG LI30-9 Position (Station 30-9)

Name	*A*	PC	MS	BYKIK	LHS
Not Open	F	0 Hz	0 Hz	0 Hz	–
Open	T	120 Hz	120 Hz	120 Hz	–

Where
A = SLOW_VLV_30_9_OK_OPEN_STATE

32.89 VVS Circuit Breaker: LI22

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVS_BRKR_OK_READY_LI22_STATE

32.90 VVS Circuit Breaker: LI24

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVS_BRKR_OK_READY_LI24_STATE

32.91 VVS Circuit Breaker: LI26

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVS_BRKR_OK_READY_LI26_STATE

32.92 VVS Circuit Breaker: LI28

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVS_BRKR_OK_READY_LI28_STATE

32.93 VVS Circuit Breaker: LI30

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VVS_BRKR_OK_READY_LI30_STATE`

32.94 YAG03 IN20 351 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `YAGS_IN20_351_OUT_LMTSW_STATE`,
B = `YAGS_IN20_351_IN_LMTSW_STATE`

32.95 YAGS1 IN20 921 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `YAGS_IN20_921_OUT_LMTSW_STATE`,
B = `YAGS_IN20_921_IN_LMTSW_STATE`

32.96 YAGS2 LI21 995 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = `YAGS_LI21_995_OUT_LMTSW_STATE`,
B = `YAGS_LI21_995_IN_LMTSW_STATE`

33 Always Evaluated

33.1 Backward Beam Stopper (RST1)

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `ST_BL551_STATE`

33.2 BLM/PIC Watchdog: IN20

Name	*A*	PC	MS	BYKIK	LHS
Faulted	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_IN20_1_PICBLM_WD_STATUS`

33.3 Bypass Recover

Name	*A*	PC	MS	BYKIK	LHS
Recovering	F	0 Hz	0 Hz	0 Hz	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	120 Hz

Where
A = `LP_BYPASS_RECOVER`

33.4 Gun RF Peak Power 20-6

Name	*A*	PC	MS	BYKIK	LHS
OK	F	120 Hz	120 Hz	120 Hz	–
Fault	T	0 Hz	0 Hz	0 Hz	–

Where
A = `FLT_20_6_TRP_STATE`

33.5 Gun Waveguide Vacuum Summary

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `WGVACGUN_STATE`

33.6 IOC-IN20-MP01 MPS Support IOC Heartbeat

Name	*A*	PC	MS	BYKIK	LHS
Fault	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MN_HEART_STATE`

33.7 Laser Heater Attenuator Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	–	–	–	0 Hz
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	–	–	–	0 Hz

Where
A = `LHATTEN_OUT_LIMIT_STATE`,
B = `LHATTEN_IN_LIMIT_STATE`

33.8 MCC Emergency Radiation Stopper

Name	*A*	PC	MS	BYKIK	LHS
Not OK	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = `EMG_RAD_STOP_STATE`

33.9 Mechanical Shutter Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	–	0 Hz	–
Out	F	T	–	–	–	–
In	T	F	–	–	–	–
Broken	T	T	0 Hz	–	0 Hz	–

Where
A = MPS_IN20_200_MSHT1_OUT_FAULT,
B = MPS_IN20_200_MSHT1_IN_FAULT

33.10 Mirror AM01 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = MR_BL191_STATE

33.11 MPS Beam Permit: BYKIK

Name	*A*	PC	MS	BYKIK	LHS
Not Permitted	F	–	–	0 Hz	–
Permitted	T	–	–	120 Hz	–

Where
A = LP_ALLOWS_BEAM_BYKIK

33.12 MPS Beam Permit: Gun RF

Name	*A*	PC	MS	BYKIK	LHS
Not Permitted	F	0 Hz	–	–	–
Permitted	T	120 Hz	–	–	–

Where
A = LP_ALLOWS_BEAM_POCKELS_CELL

33.13 MPS Beam Permit: Heater Shutter

Name	*A*	PC	MS	BYKIK	LHS
Not Permitted	F	–	–	–	0 Hz
Permitted	T	–	–	–	120 Hz

Where
A = LP_ALLOWS_BEAM_LH_SHUT

33.14 MPS Beam Permit: Mechanical Shutter

Name	*A*	PC	MS	BYKIK	LHS
Not Permitted	F	–	0 Hz	–	–
Permitted	T	–	120 Hz	–	–

Where
A = LP_ALLOWS_BEAM_MECH_SHUT

33.15 MPS Mechanical Shutter Position

Name	*A*	PC	MS	BYKIK	LHS
OK	F	120 Hz	120 Hz	120 Hz	–
Readback Does Not Match	T	0 Hz	0 Hz	0 Hz	–

Where
A = SHFLT_STATE

33.16 PIC HVPS LI20 - Location LKG-1535

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LI20_1_HV_PWR_STATE

33.17 PIC Raw Charge Thresholds: IN20 185

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_IN20_185_LOSSL_THRESHOLD`,
B = `PICM_IN20_185_LOSSH_THRESHOLD`

33.18 PIC Raw Charge Thresholds: IN20 232

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_IN20_232_LOSSL_THRESHOLD`,
B = `PICM_IN20_232_LOSSH_THRESHOLD`

33.19 PIC Raw Charge Thresholds: IN20 245

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_IN20_245_LOSSL_THRESHOLD`,
B = `PICM_IN20_245_LOSSH_THRESHOLD`

33.20 PIC Raw Charge Thresholds: IN20 665

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_IN20_665_LOSSL_THRESHOLD`,
B = `PICM_IN20_665_LOSSH_THRESHOLD`

33.21 PIC Raw Charge Thresholds: IN20 775

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_IN20_775_LOSSL_THRESHOLD`,
B = `PICM_IN20_775_LOSSH_THRESHOLD`

33.22 PIC Raw Charge Thresholds: IN20 933

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_IN20_933_LOSSL_THRESHOLD`,
B = `PICM_IN20_933_LOSSH_THRESHOLD`

33.23 PIC Raw Charge Thresholds: LI28 916

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_LI28_916_LOSSL_THRESHOLD`,
B = `PICM_LI28_916_LOSSH_THRESHOLD`

33.24 PIC Raw Charge Thresholds: LI29 146

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_LI29_146_LOSSL_THRESHOLD`,
B = `PICM_LI29_146_LOSSH_THRESHOLD`

33.25 PIC Raw Charge Thresholds: LI29 446

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_LI29_446_LOSSL_THRESHOLD`,
B = `PICM_LI29_446_LOSSH_THRESHOLD`

33.26 PIC Raw Charge Thresholds: LI29 546

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LI29_546_LOSSL_THRESHOLD,
B = PICM_LI29_546_LOSSH_THRESHOLD

33.27 PIC Raw Charge Thresholds: LI29 801

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LI29_801_LOSSL_THRESHOLD,
B = PICM_LI29_801_LOSSH_THRESHOLD

33.28 PIC Raw Charge Thresholds: LI29 956

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LI29_956_LOSSL_THRESHOLD,
B = PICM_LI29_956_LOSSH_THRESHOLD

33.29 PIC Raw Charge Thresholds: LI30 146

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_LI30_146_LOSSL_THRESHOLD`,
B = `PICM_LI30_146_LOSSH_THRESHOLD`

33.30 PIC Raw Charge Thresholds: LI30 446

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_LI30_446_LOSSL_THRESHOLD`,
B = `PICM_LI30_446_LOSSH_THRESHOLD`

33.31 PIC Raw Charge Thresholds: LI30 546

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = `PICM_LI30_546_LOSSL_THRESHOLD`,
B = `PICM_LI30_546_LOSSH_THRESHOLD`

33.32 PIC Raw Charge Thresholds: LI30 801

Name	*B*	*A*	PC	MS	BYKIK	LHS
Broken	F	F	0 Hz	0 Hz	0 Hz	–
Over High Threshold	F	T	0 Hz	0 Hz	0 Hz	–
Under Low Threshold	T	F	0 Hz	0 Hz	0 Hz	–
OK	T	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LI30_801_LOSSL_THRESHOLD,
B = PICM_LI30_801_LOSSH_THRESHOLD

33.33 PIC Trigger Missed (LN11)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_IN20_665_NO_TRIG_MISSED

33.34 PIC Trigger Missed (LN22)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_LI28_916_NO_TRIG_MISSED

33.35 PIC Trigger Missed (LN25)

Name	*A*	PC	MS	BYKIK	LHS
Missed	F	0 Hz	0 Hz	0 Hz	–
OK	T	120 Hz	120 Hz	120 Hz	–

Where
A = PICM_BSY0_16_NO_TRIG_MISSED

33.36 Pockels Cell AND Gate 100

Name	*A*	PC	MS	BYKIK	LHS
Bypassed	F	0 Hz	0 Hz	0 Hz	–
Active	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_IN20_100_ANDALLACTV_STATE`

33.37 Pockels Cell AND Gate 200

Name	*A*	PC	MS	BYKIK	LHS
Bypassed	F	0 Hz	0 Hz	0 Hz	–
Active	T	120 Hz	120 Hz	120 Hz	–

Where
A = `MPS_IN20_200_ANDALLACTV_STATE`

33.38 Rate Request: BYKIK 1 Hz

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	–	–	120 Hz	–
Requested	T	–	–	1 Hz	–

Where
A = `LP_MAX_RATE_BYKIK_1_HZ`

33.39 Rate Request: BYKIK 10 Hz

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	–	–	120 Hz	–
Requested	T	–	–	10 Hz	–

Where
A = `LP_MAX_RATE_BYKIK_10_HZ`

33.40 Rate Request: BYKIK 30 Hz

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	–	–	120 Hz	–
Requested	T	–	–	30 Hz	–

Where
A = `LP_MAX_RATE_BYKIK_30_HZ`

33.41 Rate Request: BYKIK 60 Hz

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	–	–	120 Hz	–
Requested	T	–	–	60 Hz	–

Where
A = `LP_MAX_RATE_BYKIK_60_HZ`

33.42 Rate Request: BYKIK Burst

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	–	–	120 Hz	–
Requested	T	–	–	Burst Mode	–

Where
A = `LP_MAX_RATE_BYKIK_BURST`

33.43 Rate Request: BYKIK Single Shot

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	–	–	120 Hz	–
Requested	T	–	–	Single Shot	–

Where
A = `LP_MAX_RATE_BYKIK_SINGLE_SHOT`

33.44 Rate Request: Pockels Cell 1 Hz

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	120 Hz	–	–	–
Requested	T	1 Hz	–	–	–

Where
A = LP_MAX_RATE_PC_1_HZ

33.45 Rate Request: Pockels Cell 10 Hz

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	120 Hz	–	–	–
Requested	T	10 Hz	–	–	–

Where
A = LP_MAX_RATE_PC_10_HZ

33.46 Rate Request: Pockels Cell 30 Hz

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	120 Hz	–	–	–
Requested	T	30 Hz	–	–	–

Where
A = LP_MAX_RATE_PC_30_HZ

33.47 Rate Request: Pockels Cell 60 Hz

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	120 Hz	–	–	–
Requested	T	60 Hz	–	–	–

Where
A = LP_MAX_RATE_PC_60_HZ

33.48 Rate Request: Pockels Cell Burst

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	120 Hz	–	–	–
Requested	T	Burst Mode	–	–	–

Where
A = `LP_MAX_RATE_PC_BURST`

33.49 Rate Request: Pockels Cell Single Shot

Name	*A*	PC	MS	BYKIK	LHS
Not Requested	F	120 Hz	–	–	–
Requested	T	Single Shot	–	–	–

Where
A = `LP_MAX_RATE_PC_SINGLE_SHOT`

33.50 VVMG IN20 175 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VV_BL175_STATE`

33.51 VVPG IN20 155 Position

Name	*A*	PC	MS	BYKIK	LHS
Not Out	F	0 Hz	0 Hz	0 Hz	–
Out	T	120 Hz	120 Hz	120 Hz	–

Where
A = `VV_BL155_STATE`

33.52 VVS Circuit Breaker: LI20

Name	*A*	PC	MS	BYKIK	LHS
Not On	F	0 Hz	0 Hz	0 Hz	–
On	T	120 Hz	120 Hz	120 Hz	–

Where
A = VVS_BRKR_OK_READY_LI20_STATE

33.53 YAG01 IN20 211 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = YAGS_IN20_211_OUT_LMTSW_STATE,
B = YAGS_IN20_211_IN_LMTSW_STATE

33.54 YAGG1 IN20 841 Position

Name	*B*	*A*	PC	MS	BYKIK	LHS
Moving	F	F	0 Hz	0 Hz	0 Hz	–
Out	F	T	120 Hz	120 Hz	120 Hz	–
In	T	F	10 Hz	10 Hz	10 Hz	–
Broken	T	T	0 Hz	0 Hz	0 Hz	–

Where
A = YAGS_IN20_841_OUT_LMTSW_STATE,
B = YAGS_IN20_841_IN_LMTSW_STATE

34 Ignore Logic

34.1 A-Line Kicker Is Not Enabled

Name	*B*	*A*	PC	MS	BYKIK	LHS
Is Not Enabled	F	F	–	–	–	–

Where
A = KICK_BSY0_66_PM1_TRIG_ENB_STATUS,
B = KICK_BSY0_66_PM2_TRIG_ENB_STATUS

34.2 A-Line Secondary Target Is Out

Name	*A*	PC	MS	BYKIK	LHS
Is Out	T	–	–	–	–

Where
A = TRGT_BSYA_960_OUT_LIMSW_POSITION

34.3 A-Line SL10 Is Closed

Name	*D*	*C*	*B*	*A*	PC	MS	BYKIK	LHS
Closed	T	T	T	T	–	–	–	–

Where
A = SLIT_BSYA_2010_SL10_FB_IN_STATE,
B = SLIT_BSYA_2010_SL10_FT_IN_STATE,
C = SLIT_BSYA_2010_SL10_RB_IN_STATE,
D = SLIT_BSYA_2010_SL10_RT_IN_STATE

34.4 BX01/BX02 Is Off

Name	*B*	*A*	PC	MS	BYKIK	LHS
Off	F	T	–	–	–	–

Where
A = BEND_IN20_751_OFF_STATE,
B = BEND_IN20_751_OK_STATE

34.5 BX01/BX02 Is On

Name	B	A	PC	MS	BYKIK	LHS
On	T	F	–	–	–	–

Where
A = BEND_IN20_751_OFF_STATE,
B = BEND_IN20_751_OK_STATE

34.6 BXG Is Off

Name	B	A	PC	MS	BYKIK	LHS
Off	F	T	–	–	–	–

Where
A = BEND_IN20_231_OFF_STATE,
B = BEND_IN20_231_OK_STATE

34.7 BXG Is On

Name	B	A	PC	MS	BYKIK	LHS
On	T	F	–	–	–	–

Where
A = BEND_IN20_231_OFF_STATE,
B = BEND_IN20_231_OK_STATE

34.8 Diag Stopper HFX DG2 Is In

Name	A	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = HFX_DG2_STP_01_IN_DI_POSITION

34.9 Diag Stopper HFX UM6 Is In

Name	*A*	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = HFX_UM6_STP_01_IN_DI_POSITION

34.10 Diag Stopper XCS SB1 Is In

Name	*A*	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = XCS_SB1_STP_01_CLS_DI_POSITION

34.11 Laser Heater Attenuator Is In

Name	*A*	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = LHATTEN_IN_LIMIT_STATE

34.12 LTU Dechirper Is Out

Name	*D*	*C*	*B*	*A*	PC	MS	BYKIK	LHS
Out	T	T	T	T	–	–	–	–

Where
A = DCHP_LTU1_545_OUT_LIMSW_NEGY_POSITION,
B = DCHP_LTU1_545_OUT_LIMSW_POSY_POSITION,
C = DCHP_LTU1_555_OUT_LIMSW_NEGX_POSITION,
D = DCHP_LTU1_555_OUT_LIMSW_POSX_POSITION

34.13 M3H Mirror Is In Beam

Name	*A*	PC	MS	BYKIK	LHS
Is_IN	T	–	–	–	–

Where
A = HXX_HXM_MMS_01_INBEAM_POSITION

34.14 M3H Mirror Is Out of Beam

Name	*A*	PC	MS	BYKIK	LHS
IS_OUT	T	–	–	–	–

Where
A = HXX_HXM_MMS_01_B_POSITION

34.15 Spoiler SP0 Is In

Name	*A*	PC	MS	BYKIK	LHS
Is In	T	–	–	–	–

Where
A = SPLR_DMP1_765_IN_LIMSW_POSITION

34.16 ST1/ST2 Are In

Name	*B*	*A*	PC	MS	BYKIK	LHS
In	T	F	–	–	–	–

Where
A = STPR_FEE1_1_ST1ST2OUT_POSITION,
B = STPR_FEE1_1_ST1ST2IN_POSITION

34.17 Stopper MFX S4.5 Is In

Name	*A*	PC	MS	BYKIK	LHS
Is In	T	–	–	–	–

Where
A = STPR_XRT_1_S45IN_STATE

34.18 Stopper S1 Is In

Name	A	PC	MS	BYKIK	LHS
Is In	T	–	–	–	–

Where
A = STPR_FEE1_1_S1IN_POSITION

34.19 Stopper S2 Is In

Name	A	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = STPR_FEE1_1_S2IN_STATE

34.20 Stopper S2B Is In

Name	A	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = STPR_FEE1_1_S2BIN_STATE

34.21 Stopper S5B Is In

Name	A	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = STPR_FEH1_5_S5BIN_POSITION

34.22 Stopper SH1 Is In

Name	*A*	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = STPR_FEE1_1_SH1IN_STATE

34.23 Stopper SH2 Is In

Name	*B*	*A*	PC	MS	BYKIK	LHS
In	T	F	–	–	–	–

Where
A = STPR_XRT1_1_SH2OUT_STATE,
B = STPR_XRT1_1_SH2IN_STATE

34.24 Stopper XRT S5 Is In

Name	*A*	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = STPR_XRT1_1_S5IN_POSITION

34.25 Stopper XRT S6 Is In

Name	*A*	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = STPR_XRT1_1_S6IN_POSITION

34.26 Stopper: BSY D2 Summary Is In

Name	*B*	*A*	PC	MS	BYKIK	LHS
In	T	T	–	–	–	–

Where
A = STPR_BSY0_88_IN_LIMSW_A_POSITION,
B = STPR_BSY0_88_IN_LIMSW_B_POSITION

34.27 TD11 Is In

Name	A	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = TD11_IN_LIMIT_STATE

34.28 TDUND Is In

Name	A	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = DUMP_LTU1_970_TDUND_IN_POSITION

34.29 XCS Is Not In Main Line

Name	A	PC	MS	BYKIK	LHS
Not in	F	–	–	–	–

Where
A = XCS_SB_POS_HARD_POSITION

34.30 XPP-NH3-POS-00 Beamline Is In

Name	A	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = XPP_NH3_POS_00_IN_STATE

34.31 XPP-NH3-POS-00 Beamline Is Not In

Name	*A*	PC	MS	BYKIK	LHS
Not_IN	F	–	–	–	–

Where
A = XPP_NH3_POS_00_IN_STATE

34.32 YAG01 Is In

Name	*B*	*A*	PC	MS	BYKIK	LHS
In	T	F	–	–	–	–

Where
A = YAGS_IN20_211_OUT_LMTSW_STATE,
B = YAGS_IN20_211_IN_LMTSW_STATE

34.33 YAG02 Is In

Name	*A*	PC	MS	BYKIK	LHS
In	T	–	–	–	–

Where
A = YAGS_IN20_241_IN_LMTSW_STATE