MPS Logic:
2025-02-04-a

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

1.1 Flowswitch: COLL BSYA 2060 (PC20)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = `COLL_BSYA_2060_FLOW_SW_STATE`

1.2 Flowswitch: COLL BSYA 2410 (COLL24H)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.3 Flowswitch: COLL BSYA 2410 (COLL24V)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.4 Flowswitch: COLL BSYA 2410 (PC24)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = COLL_BSYA_2410_FLOW_SW_STATE

1.5 Flowswitch: COLL BSYA 2600 (PC26)

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = COLL_BSYA_2600_FLOW_SW_STATE

1.6 Flowswitch: COLL BSYA 2990 (PC29)

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = COLL_BSYA_2990_FLOW_SW_STATE

1.7 Flowswitch: COLL BSYA 3710 (C37)

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = COLL_BSYA_3710_FLOW_SW_STATE

1.8 Flowswitch: COLL BSYA 4120 (3C1A)

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = COLL_ESA0_4120_FLOW_SW_STATE

1.9 PIC Raw Charge Thresholds: BSYA 2061

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.10 PIC Raw Charge Thresholds: BSYA 2120

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.11 PIC Raw Charge Thresholds: BSYA 2220

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.12 PIC Raw Charge Thresholds: BSYA 2321

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.13 PIC Raw Charge Thresholds: BSYA 2411

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.14 PIC Raw Charge Thresholds: BSYA 2472

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.15 PIC Raw Charge Thresholds: BSYA 2473

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.16 PIC Raw Charge Thresholds: BSYA 2474

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.17 PIC Raw Charge Thresholds: BSYA 2475

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.18 PIC Raw Charge Thresholds: BSYA 2520

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.19 PIC Raw Charge Thresholds: BSYA 2601

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.20 PIC Raw Charge Thresholds: BSYA 2861

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.21 PIC Raw Charge Thresholds: BSYA 2990

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.22 PIC Raw Charge Thresholds: BSYA 3320

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.23 PIC Raw Charge Thresholds: BSYA 3720

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.24 PIC Raw Charge Thresholds: BSYA 3721

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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

1.25 PIC Raw Charge Thresholds: BSYA 3890

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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

1.26 PIC Trigger Missed (LN42)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Missed	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = PICM_BSYA_2061_NO_TRIG_MISSED

1.27 Stopper BSYA 2275 (ST22) Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.28 Stopper BSYA 2930 (ST29) Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

1.29 Temperature RTD Summary: A-line Past SL10

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = `RTD_BSYA_2060_PASTSL10SUM_STATUS`

1.30 Vac Valve BSYA 4005 (IV40)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = VVPG_BSYA_4005_POSITION_STATE

1.31 Vac Valve: VVFS BSYA 2855 (FV28)

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OPEN	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = VVFS_BSYA_2855_POSITION_STATE

1.32 Vac Valve: VVPG BSYA 2635 (IV26)

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OPEN	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = VVPG_BSYA_2635_POSITION_STATE

1.33 Vac Valve: VVPG ESA0 4195 POSITION (IV41)

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = VVPG_ESA0_4195_POSITION_STATE

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

2.1 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	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Closed	0	120 Hz	120 Hz	120 Hz	–	–	–	–
Not_Closed	1	120 Hz	120 Hz	120 Hz	–	–	–	–

2.2 Flowswitch: BPM BSYA 1020 (BPM10)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
IS_NOT_OK	F	0 Hz	0 Hz	–	–	–	–	–
OK	T	120 Hz	120 Hz	–	–	–	–	–

Where
A = `BPM_BSYA_1020_FLOW_SW_STATE`

2.3 Flowswitch: BPM BSYA 1240 (BPM12)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
IS_NOT_OK	F	0 Hz	0 Hz	–	–	–	–	–
OK	T	120 Hz	120 Hz	–	–	–	–	–

Where
A = `BPM_BSYA_1240_FLOW_SW_STATE`

2.4 Flowswitch: COLL BSYA 1015 (PC10)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
IS_NOT_OK	F	0 Hz	0 Hz	–	–	–	–	–
OK	T	120 Hz	120 Hz	–	–	–	–	–

Where
A = `COLL_BSYA_1015_FLOW_SW_STATE`

2.5 Flowswitch: COLL BSYA 1230 (PC12)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
IS_NOT_OK	F	0 Hz	0 Hz	–	–	–	–	–
OK	T	120 Hz	120 Hz	–	–	–	–	–

Where
A = `COLL_BSYA_1230_FLOW_SW_STATE`

2.6 Flowswitch: COLL BSYA 1490 (PC14)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = `COLL_BSYA_1490_FLOW_SW_STATE`

2.7 Flowswitch: COLL BSYA 1700 (PC17)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = `COLL_BSYA_1700_FLOW_SW_STATE`

2.8 PIC Raw Charge Thresholds: BSYA 1016

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

2.9 PIC Raw Charge Thresholds: BSYA 1021

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

2.10 PIC Raw Charge Thresholds: BSYA 1120

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

2.11 PIC Raw Charge Thresholds: BSYA 1320

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

2.12 PIC Raw Charge Thresholds: BSYA 1520

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

2.13 PIC Raw Charge Thresholds: BSYA 1701A

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

2.14 PIC Raw Charge Thresholds: BSYA 1701B

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

2.15 PIC Raw Charge Thresholds: BSYA 1980

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

2.16 Temperature RTD Summary: A-Line Before SL10

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	F	0 Hz	0 Hz	–	–	–	–	–
OK	T	120 Hz	120 Hz	–	–	–	–	–

Where
A = `RTD_BSYA_1015_PRESL10SUM_STATUS`

2.17 Vac Valve: VVFS BSYA 1030 (FV10)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	0 Hz	0 Hz	–	–	–	–	–
OPEN	T	120 Hz	120 Hz	–	–	–	–	–

Where
A = `VVFS_BSYA_1030_POSITION_STATE`

2.18 Vac Valve: VVPG BSYA 1018 (IV10)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	0 Hz	0 Hz	–	–	–	–	–
OPEN	T	120 Hz	120 Hz	–	–	–	–	–

Where
A = `VVPG_BSYA_1018_POSITION_STATE`

2.19 VVPG BSYA 340 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	0 Hz	0 Hz	0 Hz	–	–	–	–
Open	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = `VVPG_BSYA_340_OPEN_LIMSW_POSITION`

3 Ignored when BKRCUS Is On, STCLTS Is In, TD11 Is In, YAG01 Is In, or YAG02 Is In

3.1 BRCUS1 and BRCUSDC Consistent

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Faulted	F	F	–	–	–	–	–	–	–
BRCUS1 Not On BRCUSDC On	F	T	0 Hz	0 Hz	0 Hz	–	0 Hz	0 Hz	0 Hz
BRCUS1 On BRCUSDC Not On	T	F	0 Hz	0 Hz	0 Hz	–	0 Hz	0 Hz	0 Hz
BRCUS1 and BRCUSDC On	T	T	–	–	–	–	–	–	–

Where
A = `BEND_CLTS_180_ON_STATE`,
B = `BEND_CLTS_765_ON_STATE`

4 Ignored when BKRCUS Is On, SXR Beamline is in SC Mode, TD11 Is In, YAG01 Is In, or YAG02 Is In

4.1 BRCUSDC Current

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `BEND_CLTS_180_CURRENT_THRESHOLD`

5 Ignored when BRCUSDC Is On, STCLTS Is In, TD11 Is In, YAG01 Is In, or YAG02 Is In

5.1 BRCUS1 and BKRCUS Consistent

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Faulted	F	F	–	–	–	–	–	–	–
BRCUS1 Not On BKRCUS On	F	T	0 Hz	0 Hz	0 Hz	–	0 Hz	0 Hz	0 Hz
BRCUS1 On BKRCUS Not On	T	F	0 Hz	0 Hz	0 Hz	–	0 Hz	0 Hz	0 Hz
BRCUS1 and BKRCUS On	T	T	–	–	–	–	–	–	–

Where
A = `KICK_CLTS_185_ON_STATE`,
B = `BEND_CLTS_765_ON_STATE`

6 Ignored when BRCUSDC Is On, SXR Beamline is in SC Mode, TD11 Is In, YAG01 Is In, or YAG02 Is In

6.1 BKRCUS Current

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `KICK_CLTS_185_CURRENT_THRESHOLD`

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

7.1 Toroid Comparator Dogleg 1 (IM02 vs IM03)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

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

8.1 BXS Status

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = `BEND_IN20_931_OK_STATE`

8.2 Toroid Comparator Inj Spectrometer (IM02 vs IMS1)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

9 Ignored when BXG Is Off or YAG01 Is In

9.1 Wakefield Shield Gun Spectrometer

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `WL_BL231_IN_STATE`

10 Ignored when BXG Is On or YAG01 Is In

10.1 Wakefield Shield Straight Ahead

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `WL_BL231_OUT_STATE`

11 Ignored when Diag Stopper HFX DG2 Is In, Diag Stopper HFX UM6 Is In, Diag Stopper XCS SB1 Is In, HXR Beamline is in SC Mode, Stopper SH2 Is In, Stopper ST1L0 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 XCS SB1 VGC 02 Gate Valve Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Open	F	T	–	–	120 Hz	–	–	–	–
Closed	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

11.2 XCS SB2 VGC 01 Gate Valve Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Open	F	T	–	–	120 Hz	–	–	–	–
Closed	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

12 Ignored when Diag Stopper HFX DG2 Is In, Diag Stopper HFX UM6 Is In, HXR Beamline is in SC Mode, Stopper S5B Is In, Stopper SH2 Is In, Stopper ST1L0 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

12.1 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	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Config 1 Fault	0	–	–	0 Hz	–	–	–	–
Config 1 Ok	1	–	–	120 Hz	–	–	–	–
Not In Config 1	2	–	–	120 Hz	–	–	–	–

12.2 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	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	0	–	–	0 Hz	–	–	–	–
Ok	1	–	–	120 Hz	–	–	–	–
Not In Config 2	2	–	–	120 Hz	–	–	–	–

12.3 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	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	0	–	–	0 Hz	–	–	–	–
Ok	1	–	–	120 Hz	–	–	–	–
Not in Config 3	2	–	–	120 Hz	–	–	–	–

12.4 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	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	0	–	–	0 Hz	–	–	–	–
Ok	1	–	–	120 Hz	–	–	–	–
Not In Config 4	2	–	–	120 Hz	–	–	–	–

12.5 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	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	0	–	–	0 Hz	–	–	–	–
Ok	1	–	–	120 Hz	–	–	–	–
Not In Config 5	2	–	–	120 Hz	–	–	–	–

12.6 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	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	0	–	–	0 Hz	–	–	–	–
Ok	1	–	–	120 Hz	–	–	–	–
Not In Config 6	2	–	–	120 Hz	–	–	–	–

12.7 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	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	0	–	–	0 Hz	–	–	–	–
Ok	1	–	–	120 Hz	–	–	–	–
Not In Config 7	2	–	–	120 Hz	–	–	–	–

12.8 CXI KB2 VGC 02 Gate Valve Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Open	F	T	–	–	120 Hz	–	–	–	–
Closed	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

12.9 CXI MPS PLC Readiness Status

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
PLC Not OK	F	–	–	0 Hz	–	–	–	–
PLC OK	T	–	–	120 Hz	–	–	–	–

Where
A = `CXI_MPS_PLC_01_OK_STATUS`

12.10 CXI User Patch Panel 1 Ready

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Ready	F	–	–	0 Hz	–	–	–	–
Ready	T	–	–	120 Hz	–	–	–	–

Where
A = `CXI_USR_01_MPSFAULT_STATUS`

12.11 CXI User Patch Panel 2 Ready

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Ready	F	–	–	0 Hz	–	–	–	–
Ready	T	–	–	120 Hz	–	–	–	–

Where
A = `CXI_USR_02_MPSFAULT_STATUS`

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

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `CXI_DG1_VGC_01_OPN_DI_POSITION`

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

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `CXI_DG1_VGC_02_OPN_DI_POSITION`

12.14 CXI:DG2:VGC:01 Gate Valve Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Open	F	T	–	–	120 Hz	–	–	–	–
Closed	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

12.15 CXI:DG2:VGC:02 Gate Valve Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Open	F	T	–	–	120 Hz	–	–	–	–
Closed	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

12.16 CXI:DSC:VGC:01 Gate Valve Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Open	F	T	–	–	120 Hz	–	–	–	–
Closed	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

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

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `CXI_KB1_VGC_01_OPN_DI_POSITION`

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

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `CXI_KB1_VGC_02_OPN_DI_POSITION`

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

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `CXI_KB2_VGC_01_OPN_DI_POSITION`

12.20 CXI:SC1:VGC:01 Gate Valve Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Open	F	T	–	–	120 Hz	–	–	–	–
Closed	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = CXI_SC1_VGC_01_OPN_DI_POSITION,
B = CXI_SC1_VGC_01_CLS_DI_POSITION

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

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving or Broken	F	–	–	0 Hz	–	–	–	–
Open or Closed	T	–	–	120 Hz	–	–	–	–

Where
A = CXI_SC3_VGC_01_OPN_DI_POSITION

12.22 HF4 LAM VGC 01 Gate Valve Position

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = HF4_LAM_VGC_01_OPN_DI_POSITION

13 Ignored when Diag Stopper HFX DG2 Is In, Diag Stopper HFX UM6 Is In, HXR Beamline is in SC Mode, Stopper SH2 Is In, Stopper ST1L0 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

13.1 CXI XRT Laser Reference Mirror Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Mirror In Beam	F	–	–	0 Hz	–	–	–	–
Mirror Out of Beam	T	–	–	120 Hz	–	–	–	–

Where
A = `XRT_DIA_MMS_01_B_POSITION`

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

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `HFA_SND_VGC_01_OPN_DI_POSITION`

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

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `HFX_DIA_VGC_02_OPN_DI_POSITION`

13.4 PPS Stopper S5B Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
In	F	T	–	–	–	–	–	–	–
Out	T	F	–	–	–	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

13.5 XCS SB1 Diagnostic Stopper Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	120 Hz	–	–	–	–
In	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

13.6 XCS SB1 VGC 01 Gate Valve Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Open	F	T	–	–	120 Hz	–	–	–	–
Closed	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

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

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Closed	F	T	–	–	0 Hz	–	–	–	–
Open	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

14 Ignored when Diag Stopper HFX DG2 Is In, Diag Stopper HFX UM6 Is In, HXR Beamline is in SC Mode, Stopper SH2 Is In, Stopper ST1L0 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

14.1 HFX:DG2:VGC:01 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `HFX_DG2_VGC_01_OPN_DI_POSITION`

14.2 HFX:MON:VGC:01 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `HFX_MON_VGC_01_OPN_DI_POSITION`

14.3 HFX:MON:VGC:02 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `HFX_MON_VGC_02_OPN_DI_POSITION`

14.4 Stopper XRT S5 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	–	–	–	–	–
In	T	F	–	–	–	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

15 Ignored when Diag Stopper HFX UM6 Is In, HXR Beamline is in SC Mode, Stopper MFX S4.5 Is In, Stopper SH2 Is In, Stopper ST1L0 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

15.1 MFX MPS Summary - Downstream of Stopper 4.5

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Ok	F	–	–	0 Hz	–	–	–	–
Ok	T	–	–	120 Hz	–	–	–	–

Where
A = `MFX_MPS_1_SUM_STATE`

16 Ignored when Diag Stopper HFX UM6 Is In, HXR Beamline is in SC Mode, Stopper SH2 Is In, Stopper ST1L0 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

16.1 MEC DV4 VCG 01 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_DV4_VGC_01_OPN_DI_POSITION`

16.2 MEC DV5 VGC 01 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_DV5_VGC_01_OPN_DI_POSITION`

16.3 MEC HXM VGC 01 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_HXM_VGC_01_OPN_DI_POSITION`

16.4 MEC XT1 Reference Laser Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Out	F	–	–	0 Hz	–	–	–	–
Out	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_XT1_MMS_01_B_POSITION`

16.5 MEC XT1 VGC 01 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_XT1_VGC_01_OPN_DI_POSITION`

16.6 MEC XT2 VGC 02 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_XT2_VGC_02_OPN_DI_POSITION`

16.7 MEC XT2 VGC 03 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_XT2_VGC_03_OPN_DI_POSITION`

16.8 MEC XT2 VGC 04 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_XT2_VGC_04_OPN_DI_POSITION`

16.9 MEC XT2 VGC 05 Gate Valve Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Open	F	T	–	–	120 Hz	–	–	–	–
Closed	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

16.10 MEC XT2 VGC 06 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_XT2_VGC_06_OPN_DI_POSITION`

17 Ignored when Diag Stopper HFX UM6 Is In, HXR Beamline is in SC Mode, Stopper SH2 Is In, Stopper ST1L0 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

17.1 DG2 Diagnostic Stopper Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
In	F	T	–	–	–	–	–	–	–
Out	T	F	–	–	–	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

17.2 MEC BXL VGC 01 Gate Valve Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_BXL_VGC_01_OPN_DI_POSITION`

17.3 MEC XRT Attenuator Inspection Mirror Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Mirror Not Out	F	–	–	0 Hz	–	–	–	–
Mirror Out	T	–	–	120 Hz	–	–	–	–

Where
A = `MEC_HXM_MMS_04_B_POSITION`

17.4 MFX Gate Valve Summary - Upstream of Stopper 4.5

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not All Out	F	–	–	0 Hz	–	–	–	–
All Out	T	–	–	120 Hz	–	–	–	–

Where
A = `MFX_XRT_VGC_OUT_SUM_STATE`

17.5 Stopper MFX S4.5 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	120 Hz	–	–	–	–
In	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = `STPR_XRT_1_S45OUT_STATE`,
B = `STPR_XRT_1_S45IN_STATE`

17.6 Stopper XRT S6 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
In	F	T	–	–	120 Hz	–	–	–	–
Out	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = `STPR_XRT1_1_S6IN_POSITION`,
B = `STPR_XRT1_1_S6OUT_POSITION`

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

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Closed	F	T	–	–	0 Hz	–	–	–	–
Open	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = `HXX_LOM_VGC_01_CLS_DI_STATE`,
B = `HXX_LOM_VGC_01_OPN_DI_STATE`

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

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `HXX_MXT_VGC_01_OPN_DI_POSITION`

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

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `HXX_MXT_VGC_02_OPN_DI_POSITION`

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

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Closed	F	T	–	–	0 Hz	–	–	–	–
Open	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

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

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Open	F	–	–	0 Hz	–	–	–	–
Open	T	–	–	120 Hz	–	–	–	–

Where
A = `HXX_MXT_VGC_05_OPN_DI_POSITION`

17.12 XRT-M2 Mirror and DG2 STP Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS
In Transit: DG2 STP Not In Beam, XRT-M2 Mirror Not Out	F	F	–	–	0 Hz	–	–	–
In Transit: DG2 STP Not In Beam, XRT-M2 Mirror Out	F	T	–	–	120 Hz	–	–	–
Safe: DG2 STP In Beam, XRT-M2 Mirror Not Out	T	F	–	–	120 Hz	–	–	–
Safe: DG2 STP In Beam, XRT-M2 Mirror Out	T	T	–	–	120 Hz	–	–	–

Where
A = `HXX_HXM_MMS_01_B_POSITION`,
B = `HFX_DG2_STP_01_IN_DI_POSITION`

18 Ignored when HXR Beamline is in SC Mode, Stopper SH2 Is In, Stopper ST1L0 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

18.1 UM6 Diagnostic Stopper Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
In	F	T	–	–	–	–	–	–	–
Out	T	F	–	–	–	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = HFX_UM6_STP_01_IN_DI_POSITION,
B = HFX_UM6_STP_01_OUT_DI_POSITION

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

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Closed	F	T	–	–	0 Hz	–	–	–	–
Open	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = HXX_UM6_VGC_01_CLS_DI_STATE,
B = HXX_UM6_VGC_01_OPN_DI_STATE

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

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	120 Hz	–	–	–	–
In	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

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

19 Ignored when HXR Beamline is in SC Mode, Stopper SH2 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

19.1 XRT HOMS Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
Ok	T	–	–	120 Hz	–	–	–	–

Where
A = `MPLN_FEEH_1_XRTHOMSFSTFLT_STATE`

20 Ignored when HXR Beamline is in SC Mode, Stopper ST1L0 Is In, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

20.1 SH2 PPS Stopper Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	120 Hz	–	–	–	–
In	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = `STPR_XRT1_1_SH2OUT_STATE`,
B = `STPR_XRT1_1_SH2IN_STATE`

21 Ignored when HXR Beamline is in SC Mode, Stopper: BSY D2 Summary Is In, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

21.1 BLMH13 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1375_I1_THRESHOLD

21.2 BLMH13 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1375_I0_THRESHOLD

21.3 BLMH14 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1475_I1_THRESHOLD

21.4 BLMH14 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1475_I0_THRESHOLD

21.5 BLMH15 Threshold 500 ms Fault

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1575_I1_THRESHOLD

21.6 BLMH15 Threshold Single Shot Fault

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1575_I0_THRESHOLD

21.7 BLMH16 Threshold 500 ms Fault

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1675_I1_THRESHOLD

21.8 BLMH16 Threshold Single Shot Fault

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1675_I0_THRESHOLD

21.9 BLMH17 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1775_I1_THRESHOLD

21.10 BLMH17 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1775_I0_THRESHOLD

21.11 BLMH18 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1875_I1_THRESHOLD

21.12 BLMH18 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1875_I0_THRESHOLD

21.13 BLMH19 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1975_I1_THRESHOLD

21.14 BLMH19 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_1975_I0_THRESHOLD

21.15 BLMH20 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2075_I1_THRESHOLD

21.16 BLMH20 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2075_I0_THRESHOLD

21.17 BLMH21 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2175_I1_THRESHOLD

21.18 BLMH21 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2175_I0_THRESHOLD

21.19 BLMH22 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2275_I1_THRESHOLD

21.20 BLMH22 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2275_I0_THRESHOLD

21.21 BLMH23 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2375_I1_THRESHOLD

21.22 BLMH23 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2375_I0_THRESHOLD

21.23 BLMH24 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2475_I1_THRESHOLD

21.24 BLMH24 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2475_I0_THRESHOLD

21.25 BLMH25 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2575_I1_THRESHOLD

21.26 BLMH25 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2575_I0_THRESHOLD

21.27 BLMH26 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2675_I1_THRESHOLD

21.28 BLMH26 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2675_I0_THRESHOLD

21.29 BLMH27 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2775_I1_THRESHOLD

21.30 BLMH27 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2775_I0_THRESHOLD

21.31 BLMH28 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2875_I1_THRESHOLD

21.32 BLMH28 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2875_I0_THRESHOLD

21.33 BLMH29 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2975_I1_THRESHOLD

21.34 BLMH29 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_2975_I0_THRESHOLD

21.35 BLMH30 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3075_I1_THRESHOLD

21.36 BLMH30 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3075_I0_THRESHOLD

21.37 BLMH31 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3175_I1_THRESHOLD

21.38 BLMH31 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3175_I0_THRESHOLD

21.39 BLMH32 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3275_I1_THRESHOLD

21.40 BLMH32 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3275_I0_THRESHOLD

21.41 BLMH33 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3375_I1_THRESHOLD

21.42 BLMH33 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3375_I0_THRESHOLD

21.43 BLMH34 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3475_I1_THRESHOLD

21.44 BLMH34 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3475_I0_THRESHOLD

21.45 BLMH35 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3575_I1_THRESHOLD

21.46 BLMH35 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3575_I0_THRESHOLD

21.47 BLMH36 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3675_I1_THRESHOLD

21.48 BLMH36 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3675_I0_THRESHOLD

21.49 BLMH37 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3775_I1_THRESHOLD

21.50 BLMH37 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3775_I0_THRESHOLD

21.51 BLMH38 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3875_I1_THRESHOLD

21.52 BLMH38 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3875_I0_THRESHOLD

21.53 BLMH39 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3975_I1_THRESHOLD

21.54 BLMH39 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_3975_I0_THRESHOLD

21.55 BLMH40 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4075_I1_THRESHOLD

21.56 BLMH40 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4075_I0_THRESHOLD

21.57 BLMH41 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4175_I1_THRESHOLD

21.58 BLMH41 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4175_I0_THRESHOLD

21.59 BLMH42 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4275_I1_THRESHOLD

21.60 BLMH42 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4275_I0_THRESHOLD

21.61 BLMH43 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4375_I1_THRESHOLD

21.62 BLMH43 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4375_I0_THRESHOLD

21.63 BLMH44 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4475_I1_THRESHOLD

21.64 BLMH44 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4475_I0_THRESHOLD

21.65 BLMH45 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4575_I1_THRESHOLD

21.66 BLMH45 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4575_I0_THRESHOLD

21.67 BLMH46 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4675_I1_THRESHOLD

21.68 BLMH46 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = CBLM_UNDH_4675_I0_THRESHOLD

21.69 BLMH47 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `CBLM_UNDH_4775_I1_THRESHOLD`

21.70 BLMH47 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `CBLM_UNDH_4775_I0_THRESHOLD`

21.71 BYDSH Current

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = `BEND_DMPH_395_CURRENT_THRESHOLD`

21.72 BYDSH Magnet Power Status

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Inconsistent	F	F	–	–	0 Hz	–	–	–	–
On	F	T	–	–	120 Hz	–	–	–	–
Off	T	F	–	–	0 Hz	–	–	–	–
Inconsistent	T	T	–	–	0 Hz	–	–	–	–

Where
A = `BEND_DMPH_395_ON_STATE`,
B = `BEND_DMPH_395_OFF_STATE`

21.73 CBXFEL Station F Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Out	F	–	–	0 Hz	–	–	–	–
Out	T	–	–	–	–	–	–	–

Where
A = BOD_UNDH_1369_Y_OUT_LMTSW_STATE

21.74 FEE Summary Fault - HXR Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = MPLN_FEEH_1_FASTFLT_STATE

21.75 FEE Summary Fault - HXR Fast Fault 2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = MPLN_FEEH_2_FASTFLT_STATE

21.76 FEE Summary Fault - HXR Gas System Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = MPLN_FEEH_1_GASFASTFLT_STATE

21.77 FEE Summary Fault - HXR Gas System Fast Fault 2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = `MPLN_FEEH_2_GASFASTFLT_STATE`

21.78 FEE Summary Fault - HXR Motion Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = `MPLN_FEEH_1_MCFASTFLT_STATE`

21.79 FEE Summary Fault - HXR Motion Fast Fault 2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = `MPLN_FEEH_2_MCFASTFLT_STATE`

21.80 FEE Summary Fault - HXR Optics Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = MPLN_FEEH_1_OPTFASTFLT_STATE

21.81 FEE Summary Fault - HXR Optics Fast Fault 2

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = MPLN_FEEH_2_OPTFASTFLT_STATE

21.82 FEE Summary Fault - HXR Vacuum Fast Fault 1

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = MPLN_FEEH_1_VACFASTFLT_STATE

21.83 FEE Summary Fault - HXR Vacuum Fast Fault 2

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = MPLN_FEEH_2_VACFASTFLT_STATE

21.84 FEE Vacuum - LFE Fast Shutter Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = `VVFS_FEEH_1_POSITION_STATE`

21.85 HXR CBLM Alive and Updating

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = `MPS_UNDH_1_CBLM_WDOG_STATE_STATE`

21.86 HXR CBLM PMT High Voltage

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	120 Hz

Where
A = `MPS_UNDH_1_CBLM_RMON_STATE_STATE`

21.87 HXRSS Chicane Bend Power Supply

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Broken	F	F	–	–	0 Hz	–	–	–	–
ON	F	T	–	–	120 Hz	–	–	–	–
OFF	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = `BEND_UNDH_2810_ON_STATE`,
B = `BEND_UNDH_2810_OFF_STATE`

21.88 HXRSS Crystal Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	120 Hz	–	–	–	–
In	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = `XTAL_UNDH_2850_OUT_LMTSW_STATE`,
B = `XTAL_UNDH_2850_IN_ENCDR_STATE`

21.89 HXRSS Crystal Valid Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Valid	F	–	–	0 Hz	–	–	–	–
Valid	T	–	–	120 Hz	–	–	–	–

Where
A = `XTAL_UNDH_2850_POSITIONSTAT_STATE`

21.90 HXRSS Mode

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 : fulle rate (120 Hz) beam allowed, HXRSS Phase Shifter /
    Sase Mode
 * state = 2 : no beam allowed, HXRSS undefined state
 */

state = (unsigned int) -1;

/*
 * Allow beam if HXRSS is on in SEEDED Mode:
 *   Magnet is on
 *     BEND_UNDH_2810_ON_STATE
 *   Magnet is in tolerance
 *     BEND_UNDH_2810_INTOL_BMIN_STATE
 *   Photon energy is OK (10 < E < 17 GeV)
 *     BEND_DMPH_400_INTOL_BRANGE_STATE
```

```
 *    Crystal is IN
 *      XTAL_UNDH_2850_IN_ENCDR_STATE
 * Allow beam if HXRSS is in Phase Shifter / Sase Mode:
 *    Magnet in ANY state
 *    Crystal is OUT
 *      XTAL_UNDH_2850_OUT_LMTSW_STATE
 * Otherwise no beam allowed
 */

if ( BEND_UNDH_2810_INTOL_BMIN_STATE &&
     BEND_UNDH_2810_ON_STATE &&
     BEND_UNDH_2810_INTOL_BMIN_STATE &&
     XTAL_UNDH_2850_IN_ENCDR_STATE )
{
  state = 0;
}
else if ( XTAL_UNDH_2850_OUT_LMTSW_STATE )
{
  state = 1;
}
else
{
  state = 2;
}
```

Name	State	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
HXRSS Seeded Mode	0	–	–	120 Hz	–	–	–	–
HXRSS Sase / Phase Shifter Mode	1	–	–	120 Hz	–	–	–	–
HXRSS Undefined Mode	2	–	–	0 Hz	–	–	–	–

21.91 Magnet In Tolerance: QE31

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = `QUAD_LTUH_720_INTOL_STATUS`

21.92 Magnet In Tolerance: QUM1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = QUAD_LTUH_820_INTOL_STATUS

21.93 Magnet In Tolerance: QUM2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = QUAD_LTUH_840_INTOL_STATUS

21.94 Magnet In Tolerance: QUM3

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = QUAD_LTUH_860_INTOL_STATUS

21.95 Magnet In Tolerance: QUM4

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = QUAD_LTUH_860_INTOL_STATUS

21.96 Magnet Power: QE31

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	–	–	0 Hz	–	–	–	–
ON	T	–	–	120 Hz	–	–	–	–

Where
A = QUAD_LTUH_720_STATE_STATUS

21.97 Magnet Power: QUM1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	–	–	0 Hz	–	–	–	–
ON	T	–	–	120 Hz	–	–	–	–

Where
A = QUAD_LTUH_820_STATE_STATUS

21.98 Magnet Power: QUM2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	–	–	0 Hz	–	–	–	–
ON	T	–	–	120 Hz	–	–	–	–

Where
A = QUAD_LTUH_840_STATE_STATUS

21.99 Magnet Power: QUM3

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	–	–	0 Hz	–	–	–	–
ON	T	–	–	120 Hz	–	–	–	–

Where
A = QUAD_LTUH_860_INTOL_STATUS

21.100 Magnet Power: QUM4

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	–	–	0 Hz	–	–	–	–
ON	T	–	–	120 Hz	–	–	–	–

Where
A = QUAD_LTUH_880_STATE_STATUS

21.101 OTR01 IN20 541 Position and TDUND Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = OTRS_IN20_541_OUT_LMTSW_STATE,
B = OTRS_IN20_541_IN_LMTSW_STATE

21.102 OTR02 IN20 571 Position and TDUND Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = OTRS_IN20_571_OUT_LMTSW_STATE,
B = OTRS_IN20_571_IN_LMTSW_STATE

21.103 OTR03 IN20 621 Position and TDUND Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `OTRS_IN20_621_OUT_LMTSW_STATE`,
B = `OTRS_IN20_621_IN_LMTSW_STATE`

21.104 OTR04 IN20 711 Position and TDUND Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `OTRS_IN20_711_OUT_LMTSW_STATE`,
B = `OTRS_IN20_711_IN_LMTSW_STATE`

21.105 OTR11 LI21 237 Position and TDUND Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `OTRS_LI21_237_OUT_LMTSW_STATE`,
B = `OTRS_LI21_237_IN_LMTSW_STATE`

21.106 OTR12 LI21 291 Position and TDUND Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `OTRS_LI21_291_OUT_LMTSW_STATE`,
B = `OTRS_LI21_291_IN_LMTSW_STATE`

21.107 OTR21 Position When TDUND Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

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

21.108 OTR33 Position and TDUND Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	120 Hz	–	–	–	–
In	T	F	–	–	0 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = `OTRS_LTUH_745_OUT_LIMIT_POSITION`,
B = `OTRS_LTUH_745_IN_LIMIT_POSITION`

21.109 OTRH1 Position When TDUND Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

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

21.110 OTRH2 Position When TDUND Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

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

21.111 PMPS HXR Rate Limit

Name	*C*	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
PMPS HXR Rate Limit: 0Hz	F	F	F	–	–	0 Hz	–	–	–	–
PMPS HXR Rate Limit: 1Hz	F	F	T	–	–	1 Hz	–	–	–	–
PMPS HXR Fault: Arbiter Inconsistent	F	T	F	–	–	0 Hz	–	–	–	–
PMPS HXR Rate Limit: 10Hz	F	T	T	–	–	10 Hz	–	–	–	–
PMPS HXR Fault: Arbiter Inconsistent	T	F	F	–	–	0 Hz	–	–	–	–
PMPS HXR Fault: Arbiter Inconsistent	T	F	T	–	–	0 Hz	–	–	–	–
PMPS HXR Fault: Arbiter Inconsistent	T	T	F	–	–	0 Hz	–	–	–	–
PMPS HXR Rate: Full Rate	T	T	T	–	–	120 Hz	–	–	–	–

Where
A = `MPLN_FEEH_1_RATEREQ_STATE`,
B = `MPLN_FEEH_10_RATEREQ_STATE`,
C = `MPLN_FEEH_120_RATEREQ_STATE`

21.112 RFBHX12 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_1305_XCUHBR_ORBIT,
B = BPMS_UNDH_1305_YCUHBR_ORBIT

21.113 RFBHX13 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_1390_XCUHBR_ORBIT,
B = BPMS_UNDH_1390_YCUHBR_ORBIT

21.114 RFBHX14 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_1490_XCUHBR_ORBIT,
B = BPMS_UNDH_1490_YCUHBR_ORBIT

21.115 RFBHX15 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_1590_XCUHBR_ORBIT,
B = BPMS_UNDH_1590_YCUHBR_ORBIT

21.116 RFBHX16 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_1690_XCUHBR_ORBIT,
B = BPMS_UNDH_1690_YCUHBR_ORBIT

21.117 RFBHX17 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_1790_XCUHBR_ORBIT,
B = BPMS_UNDH_1790_YCUHBR_ORBIT

21.118 RFBHX18 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_1890_XCUHBR_ORBIT,
B = BPMS_UNDH_1890_YCUHBR_ORBIT

21.119 RFBHX19 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_1990_XCUHBR_ORBIT,
B = BPMS_UNDH_1990_YCUHBR_ORBIT

21.120 RFBHX20 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_2090_XCUHBR_ORBIT,
B = BPMS_UNDH_2090_YCUHBR_ORBIT

21.121 RFBHX21 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_2190_XCUHBR_ORBIT,
B = BPMS_UNDH_2190_YCUHBR_ORBIT

21.122 RFBHX22 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_2290_XCUHBR_ORBIT,
B = BPMS_UNDH_2290_YCUHBR_ORBIT

21.123 RFBHX23 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_2390_XCUHBR_ORBIT,
B = BPMS_UNDH_2390_YCUHBR_ORBIT

21.124 RFBHX24 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_2490_XCUHBR_ORBIT,
B = BPMS_UNDH_2490_YCUHBR_ORBIT

21.125 RFBHX25 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_2590_XCUHBR_ORBIT,
B = BPMS_UNDH_2590_YCUHBR_ORBIT

21.126 RFBHX26 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_2690_XCUHBR_ORBIT,
B = BPMS_UNDH_2690_YCUHBR_ORBIT

21.127 RFBHX27 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_2790_XCUHBR_ORBIT,
B = BPMS_UNDH_2790_YCUHBR_ORBIT

21.128 RFBHX28 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_2890_XCUHBR_ORBIT,
B = BPMS_UNDH_2890_YCUHBR_ORBIT

21.129 RFBHX29 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_2990_XCUHBR_ORBIT,
B = BPMS_UNDH_2990_YCUHBR_ORBIT

21.130 RFBHX30 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_3090_XCUHBR_ORBIT,
B = BPMS_UNDH_3090_YCUHBR_ORBIT

21.131 RFBHX31 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_3190_XCUHBR_ORBIT,
B = BPMS_UNDH_3190_YCUHBR_ORBIT

21.132 RFBHX32 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_3290_XCUHBR_ORBIT,
B = BPMS_UNDH_3290_YCUHBR_ORBIT

21.133 RFBHX33 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_3390_XCUHBR_ORBIT,
B = BPMS_UNDH_3390_YCUHBR_ORBIT

21.134 RFBHX34 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_3490_XCUHBR_ORBIT,
B = BPMS_UNDH_3490_YCUHBR_ORBIT

21.135 RFBHX35 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_3590_XCUHBR_ORBIT,
B = BPMS_UNDH_3590_YCUHBR_ORBIT

21.136 RFBHX36 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_3690_XCUHBR_ORBIT,
B = BPMS_UNDH_3690_YCUHBR_ORBIT

21.137 RFBHX37 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_3790_XCUHBR_ORBIT,
B = BPMS_UNDH_3790_YCUHBR_ORBIT

21.138 RFBHX38 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_3890_XCUHBR_ORBIT,
B = BPMS_UNDH_3890_YCUHBR_ORBIT

21.139 RFBHX39 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_3990_XCUHBR_ORBIT,
B = BPMS_UNDH_3990_YCUHBR_ORBIT

21.140 RFBHX40 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_4090_XCUHBR_ORBIT,
B = BPMS_UNDH_4090_YCUHBR_ORBIT

21.141 RFBHX41 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_4190_XCUHBR_ORBIT,
B = BPMS_UNDH_4190_YCUHBR_ORBIT

21.142 RFBHX42 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_4290_XCUHBR_ORBIT,
B = BPMS_UNDH_4290_YCUHBR_ORBIT

21.143 RFBHX43 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_4390_XCUHBR_ORBIT,
B = BPMS_UNDH_4390_YCUHBR_ORBIT

21.144 RFBHX44 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_4490_XCUHBR_ORBIT,
B = BPMS_UNDH_4490_YCUHBR_ORBIT

21.145 RFBHX45 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_4590_XCUHBR_ORBIT,
B = BPMS_UNDH_4590_YCUHBR_ORBIT

21.146 RFBHX46 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_4690_XCUHBR_ORBIT,
B = BPMS_UNDH_4690_YCUHBR_ORBIT

21.147 RFBHX47 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	0 Hz	–	–	–	–
Y Faulted	F	T	–	–	0 Hz	–	–	–	–
X Faulted	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BPMS_UNDH_4790_XCUHBR_ORBIT,
B = BPMS_UNDH_4790_YCUHBR_ORBIT

21.148 SIOC UNDH MP04 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = SIOC_UNDH_MP04_HEARTBEAT_STATE

21.149 SIOC UNDH MP05 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = SIOC_UNDH_MP05_HEARTBEAT_STATE

21.150 SIOC UNDH MP06 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = SIOC_UNDH_MP06_HEARTBEAT_STATE

21.151 SIOC UNDH MP07 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = SIOC_UNDH_MP07_HEARTBEAT_STATE

21.152 SIOC UNDH MP08 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = SIOC_UNDH_MP08_HEARTBEAT_STATE

21.153 SIOC UNDH MP09 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = SIOC_UNDH_MP09_HEARTBEAT_STATE

21.154 SIOC UNDH MP11 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = SIOC_UNDH_MP11_HEARTBEAT_STATE

21.155 ST1L0 PPS Stopper Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	120 Hz	–	–	–	–
In	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = STPR_FEE1_ST1_OUT_POSITION,
B = STPR_FEE1_ST1_IN_POSITION

21.156 VVFS DMPH 157 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVFS_DMPH_157_POSITION_STATE

21.157 VVMG DMPH 643 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_DMPH_643_POSITION_STATE

21.158 VVMG DMPH 681 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_DMPH_681_POSITION_STATE

21.159 VVMG UNDH 1338 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_1338_POSITION_STATE

21.160 VVMG UNDH 1343 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_1343_POSITION_STATE

21.161 VVMG UNDH 1498 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_1498_POSITION_STATE

21.162 VVMG UNDH 1798 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_1798_POSITION_STATE

21.163 VVMG UNDH 2138 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_2138_POSITION_STATE

21.164 VVMG UNDH 2143 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_2143_POSITION_STATE

21.165 VVMG UNDH 2498 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_2498_POSITION_STATE

21.166 VVMG UNDH 2838 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_2838_POSITION_STATE

21.167 VVMG UNDH 2844 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_2844_POSITION_STATE

21.168 VVMG UNDH 3298 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_3298_POSITION_STATE

21.169 VVMG UNDH 3598 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_3598_POSITION_STATE

21.170 VVMG UNDH 4098 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_4098_POSITION_STATE

21.171 VVMG UNDH 4398 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_UNDH_4398_POSITION_STATE

21.172 VVPG DMPH 355 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVPG_DMPH_355_POSITION_STATE

21.173 VVPG DMPH 396 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVPG_DMPH_396_POSITION_STATE

21.174 VVPG UNDH 1288 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVPG_UNDH_1288_POSITION_STATE

21.175 VVPG UNDH 2098 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	0 Hz	–	–
OPEN	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = VVPG_UNDH_2098_POSITION_STATE

21.176 VVPG UNDH 2298 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVPG_UNDH_2298_POSITION_STATE

21.177 VVPG UNDH 2798 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVPG_UNDH_2798_POSITION_STATE

21.178 VVPG UNDH 2998 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVPG_UNDH_2998_POSITION_STATE

21.179 VVPG UNDH 3798 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVPG_UNDH_3798_POSITION_STATE

21.180 VVPG UNDH 4598 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = `VVPG_UNDH_4598_POSITION_STATE`

21.181 VVPG UNDH 5196 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = `VVPG_UNDH_5196_POSITION_STATE`

22 Ignored when HXR Beamline is in SC Mode, Stopper: BSY D2 Summary Is In, TD11 Is In, YAG01 Is In, or YAG02 Is In

22.1 BCS LION LTU1 404 Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LION404_STATE`

22.2 BCS LION LTU1 405 Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LION405_STATE`

22.3 BCS LION LTU1 504 Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LION504_STATE`

22.4 BCS LION LTU1 505 Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = LION505_STATE

22.5 BCS LION LTU1 584 Threshold

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = LION584_STATE

22.6 BCS LION LTU1 585 Threshold

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = LION585_STATE

22.7 BCS LION LTU1 716 Threshold

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = LION716_STATE

22.8 BCS LION LTU1 717 Threshold

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = LION717_STATE

22.9 BCS LION LTU1 732 Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LION732_STATE`

22.10 BCS LION LTU1 733 Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LION733_STATE`

22.11 BCS LION LTU1 752 Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LION752_STATE`

22.12 BCS LION LTU1 753 Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LION753_STATE`

22.13 BCS LION LTU1 765 Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LION765_STATE`

22.14 BCS LION LTU1 766 Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LION766_STATE`

22.15 BLM Heartbeat: Dechirper LTUH BLF545

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

Where
A = `BLM_LTUH_BLF545_TEST_L_THRESHOLD`,
B = `BLM_LTUH_BLF545_TEST_H_THRESHOLD`

22.16 BLM Pedestal Thresholds: Dechirper LTUH BLF545

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

Where
A = BLM_LTUH_BLF545_PED_L_THRESHOLD,
B = BLM_LTUH_BLF545_PED_H_THRESHOLD

22.17 BLM Raw Charge Thresholds: Dechirper LTUH BLF545

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Broken	F	F	–	–	0 Hz	–	–	–	–
Over High Threshold	F	T	–	–	0 Hz	–	–	–	–
Under Low Threshold	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = BLM_LTUH_BLF545_LOSS_L_THRESHOLD,
B = BLM_LTUH_BLF545_LOSS_H_THRESHOLD

22.18 BYD Current

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = BEND_DMPH_400_CURRENT_THRESHOLD

22.19 BYD Magnet Power Status

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Inconsistent	F	F	–	–	0 Hz	–	–	–	–
On	F	T	–	–	120 Hz	–	–	–	–
Off	T	F	–	–	0 Hz	–	–	–	–
Inconsistent	T	T	–	–	0 Hz	–	–	–	–

Where
A = BEND_DMPH_400_ON_STATE,
B = BEND_DMPH_400_OFF_STATE

22.20 BYD Watchdog

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `BEND_DMP1_400_BACT_WDOG_STATE`

22.21 BYKIK Current

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `KICK_LTUH_320_CURRENT_THRESHOLD`

22.22 BYKIK Magnet Power Status

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Inconsistent	F	F	–	–	0 Hz	–	0 Hz	–	–
On	F	T	–	–	120 Hz	–	120 Hz	–	–
Off	T	F	–	–	0 Hz	–	0 Hz	–	–
Inconsistent	T	T	–	–	0 Hz	–	0 Hz	–	–

Where
A = `KICK_LTUH_320_ON_STATE`,
B = `KICK_LTUH_320_OFF_STATE`

22.23 BYKIK Timing Delay Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
TDES OOT	F	–	–	–	–	0 Hz	–	–
TDES OK	T	–	–	–	–	120 Hz	–	–

Where
A = `KICK_LTUH_320_TDES_TIMING`

22.24 BYKIK Timing Reference Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
TREF OOT	F	–	–	–	–	0 Hz	–	–
TREF OK	T	–	–	–	–	120 Hz	–	–

Where
A = KICK_LTUH_320_TREF_TIMING

22.25 CEDL1 Temperature

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = COLL_LTUH_253_TEMP_STATE

22.26 CEDL3 Temperature

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = COLL_LTUH_452_TEMP_STATE

22.27 CXQ6 Temperature

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = COLL_BSYH_892_TEMP_STATE

22.28 CXQT22 Temperature

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `COLL_LTUH_393_TEMP_STATE`

22.29 CYBX32 Temperature

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `COLL_LTUH_276_TEMP_STATE`

22.30 CYBX36 Temperature

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `COLL_LTUH_475_TEMP_STATE`

22.31 Dechirper Mirror Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	120 Hz	–	–	–	–
In	T	F	–	–	120 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = `MIRR_LTUH_548_OUT_LIMIT_POSITION`,
B = `MIRR_LTUH_548_IN_LIMIT_POSITION`

22.32 LTU Dechirper - Horizontal Gap Too Small

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Both ends gap too small	F	F	–	–	0 Hz	–	–	–	–
Downstream end gap too small	F	T	–	–	0 Hz	–	–	–	–
Upstream end gap too small	T	F	–	–	0 Hz	–	–	–	–
Gap OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = `DCHP_LTUH_555_GAP_LIMSW_NEGZ_POSITION`,
B = `DCHP_LTUH_555_GAP_LIMSW_POSZ_POSITION`

22.33 LTU Dechirper - Vertical Gap Too Small

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Both ends gap too small	F	F	–	–	0 Hz	–	–	–	–
Downstream end gap too small	F	T	–	–	0 Hz	–	–	–	–
Upstream end gap too small	T	F	–	–	0 Hz	–	–	–	–
Gap OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = `DCHP_LTUH_545_GAP_LIMSW_NEGZ_POSITION`,
B = `DCHP_LTUH_545_GAP_LIMSW_POSZ_POSITION`

22.34 OTR33 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	120 Hz	–	–	–	–
In	T	F	–	–	10 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = `OTRS_LTUH_745_OUT_LIMIT_POSITION`,
B = `OTRS_LTUH_745_IN_LIMIT_POSITION`

22.35 PIC HVPS B911 - Location B911-2135

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `PICM_LTUH_B911_HV_PWR_STATE`

22.36 PIC HVPS B912 - Location B912-2135

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `PICM_LTUH_B912_HV_PWR_STATE`

22.37 PIC Raw Charge Thresholds: LTUH 220

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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_LTUH_220_LOSSL_THRESHOLD`,
B = `PICM_LTUH_220_LOSSH_THRESHOLD`

22.38 PIC Raw Charge Thresholds: LTUH 253

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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_LTUH_253_LOSSL_THRESHOLD,
B = PICM_LTUH_253_LOSSH_THRESHOLD

22.39 PIC Raw Charge Thresholds: LTUH 280

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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_LTUH_280_LOSSL_THRESHOLD,
B = PICM_LTUH_280_LOSSH_THRESHOLD

22.40 PIC Raw Charge Thresholds: LTUH 420

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Broken	F	F	–	–	0 Hz	–	–	–	–
Over High Threshold	F	T	–	–	0 Hz	–	–	–	–
Under Low Threshold	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = PICM_LTUH_420_LOSSL_THRESHOLD,
B = PICM_LTUH_420_LOSSH_THRESHOLD

22.41 PIC Raw Charge Thresholds: LTUH 452

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Broken	F	F	–	–	0 Hz	–	–	–	–
Over High Threshold	F	T	–	–	0 Hz	–	–	–	–
Under Low Threshold	T	F	–	–	0 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = PICM_LTUH_452_LOSSL_THRESHOLD,
B = PICM_LTUH_452_LOSSH_THRESHOLD

22.42 PIC Raw Charge Thresholds: LTUH 480

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

Where
A = `PICM_LTUH_480_LOSSL_THRESHOLD`,
B = `PICM_LTUH_480_LOSSH_THRESHOLD`

22.43 PIC Raw Charge Thresholds: LTUH 722

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

Where
A = `PICM_LTUH_722_LOSSL_THRESHOLD`,
B = `PICM_LTUH_722_LOSSH_THRESHOLD`

22.44 PIC Trigger Missed (LN28)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Missed	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = `PICM_LTUH_220_NO_TRIG_MISSED`

22.45 PIC Trigger Missed (LN29)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = PICM_LTUH_480_NO_TRIG_MISSED

22.46 SIOC LTUH MP03 HEARTBEAT

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = SIOC_LTUH_MP03_HEARTBEAT_STATE

22.47 SIOC LTUH MP05 HEARTBEAT

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = SIOC_LTUH_MP05_HEARTBEAT_STATE

22.48 SIOC LTUH MP06 HEARTBEAT

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = SIOC_LTUH_MP06_HEARTBEAT_STATE

22.49 SIOC UNDH MP02 HEARTBEAT

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = SIOC_UNDH_MP02_HEARTBEAT_STATE

22.50 SIOC UNDH MP03 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	–	–	–
OK	T	–	–	120 Hz	–	–	–	–

Where
A = SIOC_UNDH_MP03_HEARTBEAT_STATE

22.51 TDUND Flow Switch Fault with TDUND Not Out

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	F	–	–	0 Hz	–	–	–	–
OK	F	T	–	–	120 Hz	–	–	–	–
OK, TDUND Out	T	F	–	–	120 Hz	–	–	–	–
OK	T	T	–	–	120 Hz	–	–	–	–

Where
A = DUMP_LTUH_970_FLOW_SW_STATE,
B = DUMP_LTUH_970_OUT_LIMIT_POSITION

22.52 TDUND Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	–	–	–
Out	F	T	–	–	120 Hz	–	–	–	–
In	T	F	–	–	30 Hz	–	–	–	–
Broken	T	T	–	–	0 Hz	–	–	–	–

Where
A = DUMP_LTUH_970_OUT_LIMIT_POSITION,
B = DUMP_LTUH_970_IN_LIMIT_POSITION

22.53 Undulator Beam Energy Lower Limit

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = BEND_DMPH_400_INTOL_BMIN_STATE

22.54 VVFS LTUH 102 POSITION

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	0 Hz	–	–
OPEN	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = VVFS_LTUH_102_POSITION_STATE

22.55 VVMG LTUH 174 POSITION

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	0 Hz	–	–
OPEN	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = VVMG_LTUH_174_POSITION_STATE

22.56 VVMG LTUH 355 POSITION

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	0 Hz	–	–
OPEN	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = VVMG_LTUH_355_POSITION_STATE

22.57 VVMG LTUH 505 POSITION

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_LTUH_505_POSITION_STATE

22.58 VVMG LTUH 670 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_LTUH_670_POSITION_STATE

22.59 VVMG LTUH 742 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_LTUH_742_POSITION_STATE

22.60 VVMG LTUH 774 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVMG_LTUH_774_POSITION_STATE

22.61 VVPG LTUH 100 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	0 Hz	–	–
OPEN	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = VVPG_LTUH_102_POSITION_STATE

22.62 VVPG LTUH 265 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	0 Hz	–	–
OPEN	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = VVPG_LTUH_265_POSITION_STATE

22.63 VVPG LTUH 435 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVPG_LTUH_435_POSITION_STATE

22.64 VVPG LTUH 580 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVPG_LTUH_580_POSITION_STATE

22.65 VVPG LTUH 725 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = VVPG_LTUH_725_POSITION_STATE

22.66 VVPG LTUH 757 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	–	–	–
OPEN	T	–	–	120 Hz	–	–	–	–

Where
A = `VVPG_LTUH_757_POSITION_STATE`

22.67 YAGPSI (YAGS:LTUH:743) Position

Name	*C*	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	F	–	–	0 Hz	–	–	–	–
Out	F	F	T	–	–	120 Hz	–	–	–	–
P1 (YAG)	F	T	F	–	–	10 Hz	–	–	–	–
Broken	F	T	T	–	–	0 Hz	–	–	–	–
P2 (OTR)	T	F	F	–	–	10 Hz	–	–	–	–
Broken	T	F	T	–	–	0 Hz	–	–	–	–
Broken	T	T	F	–	–	0 Hz	–	–	–	–
Broken	T	T	T	–	–	0 Hz	–	–	–	–

Where
A = `YAGS_LTUH_743_OUT_LMTSW_POSITION`,
B = `YAGS_LTUH_743_P1_LMTSW_POSITION`,
C = `YAGS_LTUH_743_P2_LMTSW_POSITION`

23 Ignored when HXR Beamline is in SC Mode, TD11 Is In, TDUND Is In, YAG01 Is In, or YAG02 Is In

23.1 Magnet In Tolerance: BYD1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `BEND_DMPH_400_INTOL_STATUS`

23.2 Magnet Power: BYD1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	–	–	0 Hz	–	0 Hz	–	–
ON	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `BEND_DMPH_400_STATE_STATUS`

24 Ignored when HXR Beamline is in SC Mode, TD11 Is In, YAG01 Is In, or YAG02 Is In

24.1 BCS PIC RAW Charge Threshold DMP 997

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	0 Hz	0 Hz	0 Hz	–	0 Hz	0 Hz	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	120 Hz	120 Hz	120 Hz

Where
A = `PIC997_STATE`

24.2 BCS PIC RAW Charge Threshold DMP 998

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	0 Hz	0 Hz	0 Hz	–	0 Hz	0 Hz	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	120 Hz	120 Hz	120 Hz

Where
A = `PIC998_STATE`

24.3 D2 Summary Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	0 Hz	–	0 Hz	–	–
Out	F	T	–	–	120 Hz	–	120 Hz	–	–
In	T	F	–	–	0 Hz	–	120 Hz	–	–
Broken	T	T	–	–	0 Hz	–	0 Hz	–	–

Where
A = `STPR_BSYH_847_OUT_LIMIT_POSITION`,
B = `STPR_BSYH_847_IN_LIMIT_POSITION`

24.4 PIC Raw Charge Thresholds: BSYH 762 (PC90)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

24.5 PIC Raw Charge Thresholds: BSYH 836 (PC119)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

24.6 SIOC BSYH MP01 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `SIOC_BSYH_MP01_HEARTBEAT_STATE`

24.7 SIOC BSYH MP02 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `SIOC_BSYH_MP02_HEARTBEAT_STATE`

24.8 SIOC BSYH MP03 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `SIOC_BSYH_MP03_HEARTBEAT_STATE`

24.9 VVPG BSYH 470 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	0 Hz	–	–
OPEN	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `VVPG_BSYH_470_POSITION_STATE`

24.10 VVPG BSYH 541 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	0 Hz	–	–
OPEN	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `VVPG_BSYH_541_POSITION_STATE`

24.11 VVPG BSYH 837 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	0 Hz	–	0 Hz	–	–
OPEN	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `VVPG_BSYH_837_POSITION_STATE`

25 Ignored when Laser Heater Attenuator Is In

25.1 Laser Heater Photodiode Shutter Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

25.2 OTRH1 Position When LH Atten Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

25.3 OTRH2 Position When LH Atten Not In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

26 Ignored when MR1K1 Is In, ST3K4 Is In, STCLTS Is In, TD11 Is In, TDUNDB Is In, YAG01 Is In, or YAG02 Is In

26.1 FEE Summary Fault - TMO Fast Shutter Fault 2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_XGMDFSTFLT_STATE`

26.2 FEE Summary Fault - TMO Motion Control Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_TMOMCFASTFLT_STATE`

26.3 FEE Summary Fault - TMO Motion Control Fast Fault 2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_2_TMOMCFASTFLT_STATE`

26.4 FEE Summary Fault - TMO Vacuum Fast Fault 2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_2_TMOVACFASTFLT_STATE`

27 Ignored when MR1K1 Is In, STCLTS Is In, TD11 Is In, TDUNDB Is In, YAG01 Is In, or YAG02 Is In

27.1 FEE Summary Fault - TMO Fast Shutter Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_GMDFSTFLT_STATE`

27.2 FEE Summary Fault - TMO Vacuum Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_TMOVACFASTFLT_STATE`

27.3 SXR TMO Optics Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_TMOOPTFASTFLT_STATE`

28 Ignored when MR1K1 Is Out, STCLTS Is In, TD11 Is In, TDUNDB Is In, YAG01 Is In, or YAG02 Is In

28.1 SXR RIX Motion Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_RIXMCFASTFLT_STATE`

28.2 SXR RIX Vacuum Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_RIXVACFASTFLT_STATE`

29 Ignored when STCLTS Is In, SXR Beamline is in SC Mode, TD11 Is In, YAG01 Is In, or YAG02 Is In

29.1 SIOC BSYS MP01 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = SIOC_BSYS_MP01_HEARTBEAT_STATE

29.2 SIOC BSYS MP02 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = SIOC_BSYS_MP02_HEARTBEAT_STATE

29.3 SIOC BSYS MP03 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = SIOC_BSYS_MP03_HEARTBEAT_STATE

29.4 SIOC BSYS MP04 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = SIOC_BSYS_MP04_HEARTBEAT_STATE

30 Ignored when STCLTS Is In, SXRSS M1/Grating Is Out, TD11 Is In, TDUNDB Is In, YAG01 Is In, or YAG02 Is In

30.1 SXRSS Guardian OK

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPS_UNDS_1_SXRSS_GUARDIAN_OK_STATE`

30.2 SXRSS Guardian ON

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPS_UNDS_1_SXRSS_GUARDIAN_ON_STATE`

31 Ignored when STCLTS Is In, TD11 Is In, TDUNDB Is In, YAG01 Is In, or YAG02 Is In

31.1 BLMS16 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_1610_I1_THRESHOLD

31.2 BLMS16 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_1610_I0_THRESHOLD

31.3 BLMS17 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_1710_I1_THRESHOLD

31.4 BLMS17 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_1710_I0_THRESHOLD

31.5 BLMS18 Threshold 500 ms Fault

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_1810_I1_THRESHOLD

31.6 BLMS18 Threshold Single Shot Fault

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_1810_I0_THRESHOLD

31.7 BLMS19 Threshold 500 ms Fault

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_1910_I1_THRESHOLD

31.8 BLMS19 Threshold Single Shot Fault

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_1910_I0_THRESHOLD

31.9 BLMS20 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2010_I1_THRESHOLD

31.10 BLMS20 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2010_I0_THRESHOLD

31.11 BLMS21 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2110_I1_THRESHOLD

31.12 BLMS21 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2110_I0_THRESHOLD

31.13 BLMS22 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2210_I1_THRESHOLD

31.14 BLMS22 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2210_I0_THRESHOLD

31.15 BLMS23 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2310_I1_THRESHOLD

31.16 BLMS23 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2310_I0_THRESHOLD

31.17 BLMS24 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2410_I1_THRESHOLD

31.18 BLMS24 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2410_I0_THRESHOLD

31.19 BLMS25 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2510_I1_THRESHOLD

31.20 BLMS25 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2510_I0_THRESHOLD

31.21 BLMS26 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2610_I1_THRESHOLD

31.22 BLMS26 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2610_I0_THRESHOLD

31.23 BLMS27 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2710_I1_THRESHOLD

31.24 BLMS27 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2710_I0_THRESHOLD

31.25 BLMS28 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2810_I1_THRESHOLD

31.26 BLMS28 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2810_I0_THRESHOLD

31.27 BLMS29 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2910_I1_THRESHOLD

31.28 BLMS29 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_2910_I0_THRESHOLD

31.29 BLMS30 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3010_I1_THRESHOLD

31.30 BLMS30 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3010_I0_THRESHOLD

31.31 BLMS31 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3110_I1_THRESHOLD

31.32 BLMS31 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3110_I0_THRESHOLD

31.33 BLMS32 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3210_I1_THRESHOLD

31.34 BLMS32 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3210_I0_THRESHOLD

31.35 BLMS33 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3310_I1_THRESHOLD

31.36 BLMS33 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3310_I0_THRESHOLD

31.37 BLMS34 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3410_I1_THRESHOLD

31.38 BLMS34 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3410_I0_THRESHOLD

31.39 BLMS35 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3510_I1_THRESHOLD

31.40 BLMS35 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3510_I0_THRESHOLD

31.41 BLMS36 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3610_I1_THRESHOLD

31.42 BLMS36 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3610_I0_THRESHOLD

31.43 BLMS37 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3710_I1_THRESHOLD

31.44 BLMS37 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3710_I0_THRESHOLD

31.45 BLMS38 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3810_I1_THRESHOLD

31.46 BLMS38 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3810_I0_THRESHOLD

31.47 BLMS39 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3910_I1_THRESHOLD

31.48 BLMS39 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_3910_I0_THRESHOLD

31.49 BLMS40 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4010_I1_THRESHOLD

31.50 BLMS40 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4010_I0_THRESHOLD

31.51 BLMS41 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4110_I1_THRESHOLD

31.52 BLMS41 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4110_I0_THRESHOLD

31.53 BLMS42 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4210_I1_THRESHOLD

31.54 BLMS42 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4210_I0_THRESHOLD

31.55 BLMS43 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4310_I1_THRESHOLD

31.56 BLMS43 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4310_I0_THRESHOLD

31.57 BLMS44 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4410_I1_THRESHOLD

31.58 BLMS44 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4410_I0_THRESHOLD

31.59 BLMS45 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4510_I1_THRESHOLD

31.60 BLMS45 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4510_I0_THRESHOLD

31.61 BLMS46 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4610_I1_THRESHOLD

31.62 BLMS46 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4610_I0_THRESHOLD

31.63 BLMS47 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4710_I1_THRESHOLD

31.64 BLMS47 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = CBLM_UNDS_4710_I0_THRESHOLD

31.65 BLMS48 Threshold 500 ms Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `CBLM_UNDS_4810_I1_THRESHOLD`

31.66 BLMS48 Threshold Single Shot Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `CBLM_UNDS_4810_I0_THRESHOLD`

31.67 BYDSS Magnet Power Status

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Inconsistent	F	F	–	–	–	–	–	–	0 Hz
On	F	T	–	–	–	–	–	–	120 Hz
Off	T	F	–	–	–	–	–	–	0 Hz
Inconsistent	T	T	–	–	–	–	–	–	0 Hz

Where
A = `BEND_DMPS_395_ON_STATE`,
B = `BEND_DMPS_395_OFF_STATE`

31.68 FEE Summary Fault - SXR Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_FASTFLT_STATE`

31.69 FEE Summary Fault - SXR Fast Fault 2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_2_FASTFLT_STATE`

31.70 FEE Summary Fault - SXR Gas Attenuator Fast Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_GASATTNFSTFLT_STATE`

31.71 FEE Summary Fault - SXR Motion Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_MCFASTFLT_STATE`

31.72 FEE Summary Fault - SXR Motion Fast Fault 2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_2_MCFASTFLT_STATE`

31.73 FEE Summary Fault - SXR Vacuum Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_VACFASTFLT_STATE`

31.74 FEE Summary Fault - SXR Vacuum Fast Fault 2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_2_VACFASTFLT_STATE`

31.75 PEPPEX Zone Plate Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `MOVR_UNDS_5013_OUT_LMTSW_POSITION`,
B = `MOVR_UNDS_5013_IN_LMTSW_POSITION`

31.76 PMPS SXR Rate Limit

Name	*C*	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
PMPS SXR Rate Limit: 0Hz	F	F	F	–	–	–	–	–	–	0 Hz
PMPS SXR Rate Limit: 1Hz	F	F	T	–	–	–	–	–	–	1 Hz
PMPS SXR Fault: Arbiter Inconsistent	F	T	F	–	–	–	–	–	–	0 Hz
PMPS SXR Rate Limit: 10Hz	F	T	T	–	–	–	–	–	–	10 Hz
PMPS SXR Fault: Arbiter Inconsistent	T	F	F	–	–	–	–	–	–	0 Hz
PMPS SXR Fault: Arbiter Inconsistent	T	F	T	–	–	–	–	–	–	0 Hz
PMPS SXR Fault: Arbiter Inconsistent	T	T	F	–	–	–	–	–	–	0 Hz
PMPS SXR Rate: Full Rate	T	T	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_RATEREQ_STATE`,
B = `MPLN_FEES_10_RATEREQ_STATE`,
C = `MPLN_FEES_120_RATEREQ_STATE`

31.77 RFBSX16 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_1690_XCUSBR_ORBIT`,
B = `BPMS_UNDS_1690_YCUSBR_ORBIT`

31.78 RFBSX17 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_1790_XCUSBR_ORBIT`,
B = `BPMS_UNDS_1790_YCUSBR_ORBIT`

31.79 RFBSX18 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = BPMS_UNDS_1890_XCUSBR_ORBIT,
B = BPMS_UNDS_1890_YCUSBR_ORBIT

31.80 RFBSX19 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = BPMS_UNDS_1990_XCUSBR_ORBIT,
B = BPMS_UNDS_1990_YCUSBR_ORBIT

31.81 RFBSX20 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = BPMS_UNDS_2090_XCUSBR_ORBIT,
B = BPMS_UNDS_2090_YCUSBR_ORBIT

31.82 RFBSX21 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_2190_XCUSBR_ORBIT`,
B = `BPMS_UNDS_2190_YCUSBR_ORBIT`

31.83 RFBSX22 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_2290_XCUSBR_ORBIT`,
B = `BPMS_UNDS_2290_XCUSBR_ORBIT`

31.84 RFBSX23 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_2390_XCUSBR_ORBIT`,
B = `BPMS_UNDS_2390_XCUSBR_ORBIT`

31.85 RFBSX24 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_2490_XCUSBR_ORBIT`,
B = `BPMS_UNDS_2490_YCUSBR_ORBIT`

31.86 RFBSX25 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_2590_XCUSBR_ORBIT`,
B = `BPMS_UNDS_2590_YCUSBR_ORBIT`

31.87 RFBSX26 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_2690_XCUSBR_ORBIT`,
B = `BPMS_UNDS_2690_YCUSBR_ORBIT`

31.88 RFBSX27 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_2790_XCUSBR_ORBIT`,
B = `BPMS_UNDS_2790_YCUSBR_ORBIT`

31.89 RFBSX28 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_2890_XCUSBR_ORBIT`,
B = `BPMS_UNDS_2890_YCUSBR_ORBIT`

31.90 RFBSX29 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_2990_XCUSBR_ORBIT`,
B = `BPMS_UNDS_2990_YCUSBR_ORBIT`

31.91 RFBSX30 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_3090_XCUSBR_ORBIT`,
B = `BPMS_UNDS_3090_YCUSBR_ORBIT`

31.92 RFBSX31 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_3190_XCUSBR_ORBIT`,
B = `BPMS_UNDS_3190_YCUSBR_ORBIT`

31.93 RFBSX32 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_3290_XCUSBR_ORBIT`,
B = `BPMS_UNDS_3290_YCUSBR_ORBIT`

31.94 RFBSX33 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_3390_XCUSBR_ORBIT`,
B = `BPMS_UNDS_3390_YCUSBR_ORBIT`

31.95 RFBSX34 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_3490_XCUSBR_ORBIT`,
B = `BPMS_UNDS_3490_YCUSBR_ORBIT`

31.96 RFBSX35 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_3590_XCUSBR_ORBIT`,
B = `BPMS_UNDS_3590_YCUSBR_ORBIT`

31.97 RFBSX36 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_3690_XCUSBR_ORBIT`,
B = `BPMS_UNDS_3690_YCUSBR_ORBIT`

31.98 RFBSX37 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_3790_XCUSBR_ORBIT`,
B = `BPMS_UNDS_3790_YCUSBR_ORBIT`

31.99 RFBSX38 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_3890_XCUSBR_ORBIT`,
B = `BPMS_UNDS_3890_YCUSBR_ORBIT`

31.100 RFBSX39 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_3990_XCUSBR_ORBIT`,
B = `BPMS_UNDS_3990_YCUSBR_ORBIT`

31.101 RFBSX40 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_4090_XCUSBR_ORBIT`,
B = `BPMS_UNDS_4090_YCUSBR_ORBIT`

31.102 RFBSX41 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_4190_XCUSBR_ORBIT`,
B = `BPMS_UNDS_4190_YCUSBR_ORBIT`

31.103 RFBSX42 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_4290_XCUSBR_ORBIT`,
B = `BPMS_UNDS_4290_YCUSBR_ORBIT`

31.104 RFBSX43 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_4390_XCUSBR_ORBIT`,
B = `BPMS_UNDS_4390_YCUSBR_ORBIT`

31.105 RFBSX44 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `BPMS_UNDS_4490_XCUSBR_ORBIT`,
B = `BPMS_UNDS_4490_YCUSBR_ORBIT`

31.106 RFBSX45 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = BPMS_UNDS_4590_XCUSBR_ORBIT,
B = BPMS_UNDS_4590_YCUSBR_ORBIT

31.107 RFBSX46 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = BPMS_UNDS_4690_XCUSBR_ORBIT,
B = BPMS_UNDS_4690_YCUSBR_ORBIT

31.108 RFBSX47 Orbit Fault

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
X and Y Faulted	F	F	–	–	–	–	–	–	0 Hz
Y Faulted	F	T	–	–	–	–	–	–	0 Hz
X Faulted	T	F	–	–	–	–	–	–	0 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = BPMS_UNDS_4790_XCUSBR_ORBIT,
B = BPMS_UNDS_4790_YCUSBR_ORBIT

31.109 SIOC UNDS MP01 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_UNDS_MP01_HEARTBEAT_STATE

31.110 SIOC UNDS MP02 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_UNDS_MP02_HEARTBEAT_STATE

31.111 SIOC UNDS MP03 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_UNDS_MP03_HEARTBEAT_STATE

31.112 SIOC UNDS MP04 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_UNDS_MP04_HEARTBEAT_STATE

31.113 SIOC UNDS MP05 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_UNDS_MP05_HEARTBEAT_STATE

31.114 SIOC UNDS MP06 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_UNDS_MP06_HEARTBEAT_STATE

31.115 SIOC UNDS MP07 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_UNDS_MP07_HEARTBEAT_STATE

31.116 SXR CBLM Alive and Updating

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = MPS_UNDS_1_CBLM_WDOG_STATE_STATE

31.117 SXR CBLM PMT High Voltage

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPS_UNDS_1_CBLM_RMON_STATE_STATE`

31.118 SXR CRIX Motion Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_CRIXMCFASTFLT_STATE`

31.119 SXR CRIX Vacuum Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_CRIXVACFASTFLT_STATE`

31.120 SXR RIX Optics Fast Fault 1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Fault	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPLN_FEES_1_RIXOPTFASTFLT_STATE`

31.121 SXRSS BOD10 Position (YAGS:UNDS:3575)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	10 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `YAGS_UNDS_3575_OUT_LIMIT_POSITION`,
B = `YAGS_UNDS_3575_IN_LIMIT_POSITION`

31.122 SXRSS BOD12 Position(YAGS:UNDS:3795)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	10 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `YAGS_UNDS_3795_OUT_LIMIT_POSITION`,
B = `YAGS_UNDS_3795_IN_LIMIT_POSITION`

31.123 SXRSS Mode

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 SLIT Mode
 * state = 2 : full rate (120 Hz) beam allowed, SXRSS SASE 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
   }
```

```
*                                chicane is ON;
*                                e- beam position OK  [mm]
*                                e- beam energy   OK [GeV]
*                                SXRSS Guardian ON
*                                SXRSS Guardian OK
* Allow beam if SXRSS is ON, SLIT Mode:
*                                { slit is IN and grating/M1/M2/M3 are
   OUT }
*                                chicane is ON;
*                                e- beam position OK  [mm]
*                                e- beam energy   OK [GeV]
* 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]
* Otherwise, do not allow beam.
*
* Input Descriptions
*
*  Link Node MPS PV Name                Link Node MPS Fault Name
                Desciption
* ------------------------------
   ---------------------------------
   ------------------------------------------------
*  BEND:UNDS:3510:ON_MPS                =  BEND_UNDS_3510_ON_STATE
             =  Chicane power supply on
*  MIRR:UNDS:3520:IN_LIMIT_MPS          =
   MIRR_UNDS_3520_IN_LIMIT_POSITION     =  Grating/M1 IN limit switch
*  MIRR:UNDS:3520:OUT_LIMIT_MPS         =
   MIRR_UNDS_3520_OUT_LIMIT_POSITION    =  Grating/M1 OUT limit switch
*  SLIT:UNDS:3555:IN_LIMIT_MPS          =
   SLIT_UNDS_3555_IN_LIMIT_POSITION     =  Slit IN limit switch
*  SLIT:UNDS:3555:OUT_LIMIT_MPS         =
   SLIT_UNDS_3555_OUT_LIMIT_POSITION    =  Slit OUT limit switch
*  MIRR:UNDS:3560:IN_LIMIT_MPS          =
   MIRR_UNDS_3560_IN_LIMIT_POSITION     =  M2 IN limit switch
*  MIRR:UNDS:3560:OUT_LIMIT_MPS         =
   MIRR_UNDS_3560_OUT_LIMIT_POSITION    =  M2 OUT limit switch
*  MIRR:UNDS:3565:IN_LIMIT_MPS          =
   MIRR_UNDS_3565_IN_LIMIT_POSITION     =  M3 IN limit switch
*  MIRR:UNDS:3565:OUT_LIMIT_MPS         =
   MIRR_UNDS_3565_OUT_LIMIT_POSITION    =  M3 OUT limit switch
*  MPS:UNDS:3500:SX_HRMNC_ENERGY_MPS =
```

```
    MPS_UNDS_3500_SX_HRMNC_ENERGY_STATE =  e- beam energy safe for
    Harmonic mode
 *  MPS:UNDS:3500:SX_HRMNC_X_MPS       =  MPS_UNDS_3500_SX_HRMNC_X_STATE
        =  e- beam position safe for Harmonic mode
 *  MPS:UNDS:3500:SX_SASE_X_MPS        =  MPS_UNDS_3500_SX_SASE_X_STATE
        =  e- beam position safe for SASE mode
 *  MPS:UNDS:3500:SX_SS_ENERGY_MPS     =
    MPS_UNDS_3500_SX_SS_ENERGY_STATE    =  e- beam energy safe for
    Seeded mode
 *  MPS:UNDS:3500:SX_SS_X_MPS          =  MPS_UNDS_3500_SX_SS_X_STATE
          =  e- beam position safe for Seeded mode
 *  MPS:UNDS:1:SXRSS:GUARDIAN_ON_STATE=
    MPS_UNDS_1_SXRSS_GUARDIAN_ON_STATE  =  SXRSS Guardian Process is ON
 *  MPS:UNDS:1:SXRSS:GUARDIAN_OK_STATE=
    MPS_UNDS_1_SXRSS_GUARDIAN_OK_STATE  =  SXRSS Guardian Process is
    reporting OK
 */

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

if (    (MIRR_UNDS_3520_IN_LIMIT_POSITION &&
        (MIRR_UNDS_3565_IN_LIMIT_POSITION ||
            MIRR_UNDS_3565_OUT_LIMIT_POSITION)) &&
        BEND_UNDS_3510_ON_STATE &&
        MPS_UNDS_3500_SX_SS_X_STATE &&
        MPS_UNDS_3500_SX_SS_ENERGY_STATE &&
        MPS_UNDS_1_SXRSS_GUARDIAN_ON_STATE &&
        MPS_UNDS_1_SXRSS_GUARDIAN_OK_STATE )
{
    state = 0; /* SXRSS Seeded Mode, okay to run beam */
}

else if (   (SLIT_UNDS_3555_IN_LIMIT_POSITION  &&
   MIRR_UNDS_3520_OUT_LIMIT_POSITION &&
        MIRR_UNDS_3560_OUT_LIMIT_POSITION &&
            MIRR_UNDS_3565_OUT_LIMIT_POSITION) &&
        BEND_UNDS_3510_ON_STATE &&
        MPS_UNDS_3500_SX_SS_X_STATE &&
        MPS_UNDS_3500_SX_SS_ENERGY_STATE &&
        MPS_UNDS_1_SXRSS_GUARDIAN_ON_STATE &&
        MPS_UNDS_1_SXRSS_GUARDIAN_OK_STATE )
{
    state = 1; /* SXRSS SLIT Mode, okay to run beam */
}
```

```
else if ( MIRR_UNDS_3520_OUT_LIMIT_POSITION &&
          SLIT_UNDS_3555_OUT_LIMIT_POSITION &&
          MIRR_UNDS_3560_OUT_LIMIT_POSITION &&
          MIRR_UNDS_3565_OUT_LIMIT_POSITION &&
          MPS_UNDS_3500_SX_SASE_X_STATE )
{
    state = 2; /* SXRSS SASE Mode, okay to run beam */
}

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

Name	State	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
SXRSS Seeded Mode	0	–	–	–	–	–	–	120 Hz
SXRSS SLIT Mode	1	–	–	–	–	–	–	120 Hz
SXRSS SASE Mode	2	–	–	–	–	–	–	120 Hz
SXRSS Undefined Mode	3	–	–	–	–	–	–	0 Hz

31.124 SXRSS MSXS1 Position (MIRR:UNDS:3520)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `MIRR_UNDS_3520_OUT_LIMIT_POSITION`,
B = `MIRR_UNDS_3520_IN_LIMIT_POSITION`

31.125 SXRSS MSXS2 Position (MIRR:UNDS:3560)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `MIRR_UNDS_3560_OUT_LIMIT_POSITION`,
B = `MIRR_UNDS_3560_IN_LIMIT_POSITION`

31.126 SXRSS MSXS3 Position (MIRR:UNDS:3565)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `MIRR_UNDS_3565_OUT_LIMIT_POSITION`,
B = `MIRR_UNDS_3565_IN_LIMIT_POSITION`

31.127 SXRSS SLSXS1 Position (SLIT:UNDS:3555)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Broken	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Moving	T	T	–	–	–	–	–	–	0 Hz

Where
A = `SLIT_UNDS_3555_OUT_LIMIT_POSITION`,
B = `SLIT_UNDS_3555_IN_LIMIT_POSITION`

31.128 SXRSS Watchdog

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = `MPS_UNDS_3500_SXRSS_WDOG_STATE`

31.129 VVFS DMPS 157 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVFS_DMPS_157_POSITION_STATE`

31.130 VVMG DMPS 643 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_DMPS_643_POSITION_STATE`

31.131 VVMG DMPS 681 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_DMPS_681_POSITION_STATE`

31.132 VVMG UNDS 3511 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_UNDS_3511_POSITION_STATE`

31.133 VVMG UNDS 3568 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_UNDS_3568_POSITION_STATE`

31.134 VVMG UNDS 4998 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_UNDS_4998_POSITION_STATE`

31.135 VVPG DMPS 355 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVPG_DMPS_355_POSITION_STATE`

31.136 VVPG DMPS 396 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = VVPG_DMPS_396_POSITION_STATE

31.137 VVPG UNDS 1651 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = VVPG_UNDS_1651_POSITION_STATE

31.138 VVPG UNDS 2177 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = VVPG_UNDS_2177_POSITION_STATE

31.139 VVPG UNDS 2877 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = VVPG_UNDS_2877_POSITION_STATE

31.140 VVPG UNDS 3477 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = VVPG_UNDS_3477_POSITION_STATE

31.141 VVPG UNDS 3577 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = VVPG_UNDS_3577_POSITION_STATE

31.142 VVPG UNDS 3877 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = VVPG_UNDS_3877_POSITION_STATE

31.143 VVPG UNDS 4477 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = VVPG_UNDS_4477_POSITION_STATE

31.144 VVPG UNDS 5198 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVPG_UNDS_5198_POSITION_STATE`

32 Ignored when STCLTS Is In, TD11 Is In, YAG01 Is In, or YAG02 Is In

32.1 BRCUS1 Current

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = BEND_CLTS_765_CURRENT_THRESHOLD

32.2 BY1B Current

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = BEND_LTUS_525_CURRENT_THRESHOLD

32.3 BY1B Magnet Power Status

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Inconsistent	F	F	–	–	–	–	–	0 Hz	0 Hz
On	F	T	–	–	–	–	–	120 Hz	120 Hz
Off	T	F	–	–	–	–	–	0 Hz	0 Hz
Inconsistent	T	T	–	–	–	–	–	0 Hz	0 Hz

Where
A = BEND_LTUS_525_ON_STATE,
B = BEND_LTUS_525_OFF_STATE

32.4 BYDB Current

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = BEND_DMPS_400_CURRENT_THRESHOLD

32.5 BYDB Magnet Power Status

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Inconsistent	F	F	–	–	–	–	–	–	0 Hz
On	F	T	–	–	–	–	–	–	120 Hz
Off	T	F	–	–	–	–	–	–	0 Hz
Inconsistent	T	T	–	–	–	–	–	–	0 Hz

Where
A = BEND_DMPS_400_ON_STATE,
B = BEND_DMPS_400_OFF_STATE

32.6 BYKIKS Current

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = KICK_LTUS_350_CURRENT_THRESHOLD

32.7 BYKIKS Magnet Power Status

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Inconsistent	F	F	–	–	–	–	–	0 Hz	0 Hz
On	F	T	–	–	–	–	–	120 Hz	120 Hz
Off	T	F	–	–	–	–	–	0 Hz	0 Hz
Inconsistent	T	T	–	–	–	–	–	0 Hz	0 Hz

Where
A = KICK_LTUS_350_ON_STATE,
B = KICK_LTUS_350_OFF_STATE

32.8 BYKIKS Timing Delay Fault

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
TDES OOT	F	–	–	–	–	–	0 Hz	–
TDES OK	T	–	–	–	–	–	120 Hz	–

Where
A = KICK_LTUS_350_TDES_TIMING

32.9 BYKIKS Timing Reference Fault

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
TREF OOT	F	–	–	–	–	–	0 Hz	–
TREF OK	T	–	–	–	–	–	120 Hz	–

Where
A = KICK_LTUS_350_TREF_TIMING

32.10 CEDL13 Temperature

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = COLL_LTUS_235_TEMP_STATE

32.11 CEDL17 Temperature

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = COLL_LTUS_372_TEMP_STATE

32.12 CXBP34 Temperature

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = COLL_BSYS_859_TEMP_STATE

32.13 CYBDL Temperature

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = COLL_LTUS_116_TEMP_STATE

32.14 CYDL16 Temperature

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = COLL_LTUS_345_TEMP_STATE

32.15 Merge Magnet Ok

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Faulted	F	F	–	–	–	–	–	–	–
BRCUS1 Current Wrong	F	T	0 Hz	0 Hz	0 Hz	–	0 Hz	0 Hz	0 Hz
Not Faulted	T	F	–	–	–	–	–	–	–
Pulsed Mode Ok	T	T	–	–	–	–	–	–	–

Where
A = BEND_CLTS_765_ON_STATE,
B = BEND_CLTS_765_CURRENT_THRESHOLD

32.16 OTRDL18 (OTRS:LTUS:417) Position

Name	C	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	F	–	–	–	–	–	–	0 Hz
Out	F	F	T	–	–	–	–	–	–	120 Hz
P1 (YAG)	F	T	F	–	–	–	–	–	–	10 Hz
Broken	F	T	T	–	–	–	–	–	–	0 Hz
P2 (OTR)	T	F	F	–	–	–	–	–	–	10 Hz
Broken	T	F	T	–	–	–	–	–	–	0 Hz
Broken	T	T	F	–	–	–	–	–	–	0 Hz
Broken	T	T	T	–	–	–	–	–	–	0 Hz

Where
A = OTRS_LTUS_417_OUT_LMTSW_POSITION,
B = OTRS_LTUS_417_P1_LMTSW_POSITION,
C = OTRS_LTUS_417_P2_LMTSW_POSITION

32.17 SIOC LTUS MP01 HEARTBEAT

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_LTUS_MP01_HEARTBEAT_STATE

32.18 SIOC LTUS MP02 HEARTBEAT

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_LTUS_MP02_HEARTBEAT_STATE

32.19 SIOC LTUS MP03 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_LTUS_MP03_HEARTBEAT_STATE

32.20 SIOC LTUS MP04 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = SIOC_LTUS_MP04_HEARTBEAT_STATE

32.21 SIOC LTUS MP05 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = SIOC_LTUS_MP05_HEARTBEAT_STATE

32.22 SIOC LTUS MP06 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	–	0 Hz
OK	T	–	–	–	–	–	–	120 Hz

Where
A = SIOC_LTUS_MP06_HEARTBEAT_STATE

32.23 ST34AB Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	0 Hz	0 Hz
Out	F	T	–	–	–	–	–	120 Hz	120 Hz
In	T	F	–	–	–	–	–	0 Hz	0 Hz
Broken	T	T	–	–	–	–	–	0 Hz	0 Hz

Where
A = `STPR_BSYS_891_OUT_LIMIT_POSITION`,
B = `STPR_BSYS_891_IN_LIMIT_POSITION`

32.24 SXR Facility Mode

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NC Mode	F	–	–	–	–	–	–	–
SC Mode	T	–	–	–	–	–	0 Hz	–

Where
A = `MPS_UNDS_1_FACMODE_STATE`

32.25 TDUNDB Position (10 Hz)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	10 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `DUMP_LTUS_972_OUT_LIMIT_POSITION`,
B = `DUMP_LTUS_972_IN_LIMIT_POSITION`

32.26 TDUNDB Power when TDUNDB Is IN

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
OK (TDUNDB Not In)	F	F	–	–	–	–	–	–	120 Hz
Fault	F	T	–	–	–	–	–	–	0 Hz
OK (TDUNDB Not In)	T	F	–	–	–	–	–	–	120 Hz
OK	T	T	–	–	–	–	–	–	120 Hz

Where
A = `DUMP_LTUS_972_IN_LIMIT_POSITION`,
B = `DUMP_LTUS_972_MPSPOWER_THRESHOLD`

32.27 VVFS LTUS 109 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	0 Hz	0 Hz
OPEN	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = `VVFS_LTUS_109_POSITION_STATE`

32.28 VVMG LTUS 185 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	0 Hz	0 Hz
OPEN	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = `VVMG_LTUS_185_POSITION_STATE`

32.29 VVMG LTUS 348 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	0 Hz	0 Hz
OPEN	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = `VVMG_LTUS_348_POSITION_STATE`

32.30 VVMG LTUS 451 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_LTUS_451_POSITION_STATE`

32.31 VVMG LTUS 505 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Is Not Open	F	–	–	–	–	–	–	0 Hz
Is Open	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_LTUS_505_POSITION_STATE`

32.32 VVMG LTUS 552 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_LTUS_552_POSITION_STATE`

32.33 VVMG LTUS 656 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Is Not Open	F	–	–	–	–	–	–	0 Hz
Is Open	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_LTUS_656_POSITION_STATE`

32.34 VVMG LTUS 744 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_LTUS_744_POSITION_STATE`

32.35 VVMG LTUS 802 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_LTUS_802_POSITION_STATE`

32.36 VVMG LTUS 827 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVMG_LTUS_827_POSITION_STATE`

32.37 VVPG BSYS 904 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	0 Hz	0 Hz
OPEN	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = `VVPG_BSYS_904_POSITION_STATE`

32.38 VVPG CLTS 685 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT OPEN	F	–	–	–	–	–	0 Hz	0 Hz
OPEN	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = `VVPG_CLTS_685_POSITION_STATE`

32.39 VVPG LTUS 108 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	0 Hz	0 Hz
OPEN	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = `VVPG_LTUS_108_POSITION_STATE`

32.40 VVPG LTUS 272 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	0 Hz	0 Hz
OPEN	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = `VVPG_LTUS_272_POSITION_STATE`

32.41 VVPG LTUS 442 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVPG_LTUS_442_POSITION_STATE`

32.42 VVPG LTUS 586 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVPG_LTUS_586_POSITION_STATE`

32.43 VVPG LTUS 726 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVPG_LTUS_726_POSITION_STATE`

32.44 VVPG LTUS 757 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	–	0 Hz
OPEN	T	–	–	–	–	–	–	120 Hz

Where
A = `VVPG_LTUS_757_POSITION_STATE`

32.45 XLEAP: UMXL1H Downstream Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `WIGG_LTUS_724_DS_OUT_STATE`,
B = `WIGG_LTUS_724_DS_IN_STATE`

32.46 XLEAP: UMXL1H Upstream Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `WIGG_LTUS_724_US_OUT_STATE`,
B = `WIGG_LTUS_724_US_IN_STATE`

32.47 XLEAP: UMXL3H Downstream Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `WIGG_LTUS_770_DS_OUT_STATE`,
B = `WIGG_LTUS_770_DS_IN_STATE`

32.48 XLEAP: UMXL3H Upstream Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `WIGG_LTUS_770_US_OUT_STATE`,
B = `WIGG_LTUS_770_US_IN_STATE`

32.49 XLEAP: UMXL4H Downstream Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `WIGG_LTUS_774_DS_OUT_STATE`,
B = `WIGG_LTUS_774_DS_IN_STATE`

32.50 XLEAP: UMXL4H Upstream Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	–	–	–	–	–	–	0 Hz
Out	F	T	–	–	–	–	–	–	120 Hz
In	T	F	–	–	–	–	–	–	120 Hz
Broken	T	T	–	–	–	–	–	–	0 Hz

Where
A = `WIGG_LTUS_774_US_OUT_STATE`,
B = `WIGG_LTUS_774_US_IN_STATE`

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

33.1 Attempt to deliver Beam Code 1 when SXR DC extraction magnet is ON

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OK	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LP_DC_MODE_BC1`

33.2 BKRCUS Timing Delay Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
TDES OOT	F	–	–	–	–	–	0 Hz	–
TDES OK	T	–	–	–	–	–	120 Hz	–

Where
A = `KICK_CLTS_185_TDES_TIMING`

33.3 BKRCUS Timing Reference Fault

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
TREF OOT	F	–	–	–	–	–	0 Hz	–
TREF OK	T	–	–	–	–	–	120 Hz	–

Where
A = `KICK_CLTS_185_TREF_TIMING`

33.4 BLM/PIC Watchdog BSY0/BSYA

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_BSY0_1_PICBLM_WD_STATUS

33.5 BLM/PIC Watchdog LI24

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_LI24_1_PICBLM_WD_STATUS

33.6 BLM/PIC Watchdog LI30

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_LI30_1_PICBLM_WD_STATUS

33.7 BLRCUS Current

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = BEND_CLTS_280_CURRENT_THRESHOLD

33.8 BRCUSDC on and HXR Mode

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Normal NC Operation	F	F	–	–	–	–	–	–	–
HXR in SC mode and DC magnet not on	F	T	–	–	–	–	0 Hz	–	–
Normal NC Operation	T	F	–	–	–	–	–	–	–
Normal SC operation	T	T	–	–	–	–	–	–	–

Where
A = MPS_UNDH_1_FACMODE_STATE,
B = BEND_CLTS_765_ON_STATE

33.9 Bunch Length Monitor BL21 Position

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = BL22_OUT_STATE,
B = BL22_IN_STATE

33.10 Dump LI28 5879 Flowswitch

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = DUMP_5879_FLOW_SW_STATE

33.11 Dump LI28 5879 Klixon

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not OK	F	0 Hz	0 Hz	0 Hz	–	–	–	–
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = DUMP_5879_KLIXON_OK_STATE

33.12 Flowswitch: CE21

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `COL_805_FLOSW_STATE`

33.13 Flowswitch: COLL LI28-9

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FLOW_SW_28_9_STATE`

33.14 Flowswitch: COLL LI29-1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FLOW_SW_29_1_STATE`

33.15 Flowswitch: COLL LI29-4

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FLOW_SW_29_4_STATE`

33.16 Flowswitch: COLL LI29-5

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FLOW_SW_29_5_STATE`

33.17 Flowswitch: COLL LI29-9

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FLOW_SW_29_9_STATE`

33.18 Flowswitch: COLL LI30-1

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FLOW_SW_30_1_STATE`

33.19 Flowswitch: COLL LI30-4

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FLOW_SW_30_4_STATE`

33.20 Flowswitch: COLL LI30-5

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FLOW_SW_30_5_STATE`

33.21 HXR Facility Mode

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NC Mode	F	–	–	–	–	–	–	–
SC Mode	T	–	–	–	–	0 Hz	–	–

Where
A = `MPS_UNDH_1_FACMODE_STATE`

33.22 HXR Magnet Mode

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Faulted	F	F	–	–	–	–	–	–	–
Not Faulted	F	T	–	–	–	–	–	–	–
Not Faulted	T	F	–	–	–	–	–	–	–
HXR Mode	T	T	–	–	–	–	–	–	–

Where
A = `BEND_CLTS_180_OFF_STATE`,
B = `KICK_CLTS_185_OFF_STATE`

33.23 Inconsistent Magnet Mode

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Faulted	F	F	–	–	–	–	–	–	–
Not Faulted	F	T	–	–	–	–	–	–	–
Not Faulted	T	F	–	–	–	–	–	–	–
Both On	T	T	0 Hz	0 Hz	0 Hz	–	0 Hz	0 Hz	0 Hz

Where
A = BEND_CLTS_180_ON_STATE,
B = KICK_CLTS_185_ON_STATE

33.24 Main Manifold Gauge: LI22 Station 5

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_MM_GAUGE_OK_LI22_STATE

33.25 Main Manifold Gauge: LI23 Station 5

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_MM_GAUGE_OK_LI23_STATE

33.26 Main Manifold Gauge: LI24 Station 5

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_MM_GAUGE_OK_LI24_STATE

33.27 Main Manifold Gauge: LI25 Station 5

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_MM_GAUGE_OK_LI25_STATE

33.28 Main Manifold Gauge: LI26 Station 5

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_MM_GAUGE_OK_LI26_STATE

33.29 Main Manifold Gauge: LI27 Station 5

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_MM_GAUGE_OK_LI27_STATE

33.30 Main Manifold Gauge: LI28 Station 5

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_MM_GAUGE_OK_LI28_STATE

33.31 Main Manifold Gauge: LI29 Station 5

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_MM_GAUGE_OK_STATE

33.32 Main Manifold Gauge: LI30 Station 5

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_MM_GAUGE_30_5_OK_STATE`

33.33 OTR LI25 920 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `OTR_TCAV_OUT_STATE`,
B = `OTR_TCAV_IN_STATE`

33.34 OTR21 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

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

33.35 PIC Gas Pressure LI24

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = PIC_GAS_PRESS_STATE

33.36 PIC HVPS BSY 1 - Location B005-3921

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
ON	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = PICM_BSY0_1_HV_PWR_STATE

33.37 PIC HVPS BSY 2 - Location B005-3921

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
ON	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = PICM_BSY0_2_HV_PWR_STATE

33.38 PIC HVPS BSY 3 - Location B005-3921

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
ON	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = PICM_BSY0_3_HV_PWR_STATE

33.39 PIC HVPS BSY 4 - Location B005-3918

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
ON	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = PICM_BSY0_4_HV_PWR_STATE

33.40 PIC HVPS BSY 5 - Location B005-3918

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
ON	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `PICM_BSY0_5_HV_PWR_STATE`

33.41 PIC HVPS BSY 6 - Location B005-3918

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
ON	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `PICM_BSY0_6_HV_PWR_STATE`

33.42 PIC HVPS LI24 - Location LKF24-0235

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
ON	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `PICM_LI24_1_HV_PWR_STATE`

33.43 PIC HVPS LI30 - KG30-C1322

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
ON	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `PICM_LI30_1_HV_PWR_STATE`

33.44 PIC Raw Charge Thresholds: CLTS 280 (BLRCUS)

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

Where
A = PICM_CLTS_280_LOSSL_THRESHOLD,
B = PICM_CLTS_280_LOSSH_THRESHOLD

33.45 PIC Raw Charge Thresholds: LI24 791

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

Where
A = PICM_LI24_791_LOSSL_THRESHOLD,
B = PICM_LI24_791_LOSSH_THRESHOLD

33.46 PIC Raw Charge Thresholds: LI24 811

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

Where
A = PICM_LI24_811_LOSSL_THRESHOLD,
B = PICM_LI24_811_LOSSH_THRESHOLD

33.47 PIC Raw Charge Thresholds: LI28 916

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

Where
A = `PICM_LI28_916_LOSSL_THRESHOLD`,
B = `PICM_LI28_916_LOSSH_THRESHOLD`

33.48 PIC Raw Charge Thresholds: LI29 146

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

Where
A = `PICM_LI29_146_LOSSL_THRESHOLD`,
B = `PICM_LI29_146_LOSSH_THRESHOLD`

33.49 PIC Raw Charge Thresholds: LI29 446

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

Where
A = `PICM_LI29_446_LOSSL_THRESHOLD`,
B = `PICM_LI29_446_LOSSH_THRESHOLD`

33.50 PIC Raw Charge Thresholds: LI29 546

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

Where
A = PICM_LI29_546_LOSSL_THRESHOLD,
B = PICM_LI29_546_LOSSH_THRESHOLD

33.51 PIC Raw Charge Thresholds: LI29 801

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

Where
A = PICM_LI29_801_LOSSL_THRESHOLD,
B = PICM_LI29_801_LOSSH_THRESHOLD

33.52 PIC Raw Charge Thresholds: LI29 956

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

Where
A = PICM_LI29_956_LOSSL_THRESHOLD,
B = PICM_LI29_956_LOSSH_THRESHOLD

33.53 PIC Raw Charge Thresholds: LI30 146

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

Where
A = PICM_LI30_146_LOSSL_THRESHOLD,
B = PICM_LI30_146_LOSSH_THRESHOLD

33.54 PIC Raw Charge Thresholds: LI30 446

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

Where
A = PICM_LI30_446_LOSSL_THRESHOLD,
B = PICM_LI30_446_LOSSH_THRESHOLD

33.55 PIC Raw Charge Thresholds: LI30 546

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

Where
A = PICM_LI30_546_LOSSL_THRESHOLD,
B = PICM_LI30_546_LOSSH_THRESHOLD

33.56 PIC Raw Charge Thresholds: LI30 801

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

Where
A = PICM_LI30_801_LOSSL_THRESHOLD,
B = PICM_LI30_801_LOSSH_THRESHOLD

33.57 PIC Trigger Missed (LN16)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = PICM_LI24_791_NO_TRIG_MISSED

33.58 PIC Trigger Missed (LN22)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = PICM_LI28_916_NO_TRIG_MISSED

33.59 PIC Trigger Missed (LN25)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = PICM_BSY0_16_NO_TRIG_MISSED

33.60 Pulsed Magnet Mode Ok

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Faulted	F	F	–	–	–	–	–	–	–
BKRCUS Current Wrong	F	T	0 Hz	0 Hz	0 Hz	–	0 Hz	0 Hz	0 Hz
Not Faulted	T	F	–	–	–	–	–	–	–
Pulsed Mode Ok	T	T	–	–	–	–	–	–	–

Where
A = KICK_CLTS_185_ON_STATE,
B = KICK_CLTS_185_CURRENT_THRESHOLD

33.61 Scraper Water LI21-9 (Station 22-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_SCRAPPER_FLOW_OK_LI22_STATE

33.62 Scraper Water LI22-9 (Station 23-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_SCRAPPER_FLOW_OK_LI23_STATE

33.63 Scraper Water LI23-9 (Station 24-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_SCRAPPER_FLOW_OK_LI24_STATE

33.64 Scraper Water LI24-9 (Station 25-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SCRAPPER_FLOW_OK_LI25_STATE`

33.65 Scraper Water LI25-9 (Station 26-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SCRAPPER_FLOW_OK_LI26_STATE`

33.66 Scraper Water LI26-9 (Station 27-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SCRAPPER_FLOW_OK_LI27_STATE`

33.67 Scraper Water LI27-9 (Station 28-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SCRAPPER_FLOW_OK_LI28_STATE`

33.68 Scraper Water LI28-9 (Station 29-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_SCRAPPER_FLOW_OK_LI29_STATE

33.69 Scraper Water LI29-9 (Station 30-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_SCRAPPER_FLOW_OK_LI30_STATE

33.70 SIOC CLTS MP01 HEARTBEAT

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULTED	F	–	–	–	–	–	0 Hz	0 Hz
OK	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = SIOC_CLTS_MP01_HEARTBEAT_STATE

33.71 STCLTS Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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 = STPP_CLTS_585_OUT_LIMIT_POSITION,
B = STPR_CLTS_585_IN_LIMIT_POSITION

33.72 Stopper LI28 950 and 960 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OUT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OUT	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `BASII_STOPPER_OUT_STATE`

33.73 Sub-booster Ready: LI22

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SBST_OK_READY_LI22_STATE`

33.74 Sub-booster Ready: LI25

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SBST_OK_READY_LI25_STATE`

33.75 Sub-booster Ready: LI26

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SBST_OK_READY_LI26_STATE`

33.76 Sub-booster Ready: LI27

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SBST_OK_READY_LI27_STATE`

33.77 Sub-booster Ready: LI28

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SBST_OK_READY_LI28_STATE`

33.78 Sub-booster Ready: LI29

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SBST_OK_READY_LI29_STATE`

33.79 Sub-booster Ready: LI30

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SBST_OK_READY_LI30_STATE`

33.80 SXR Magnet Mode Ok

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Faulted	F	F	–	–	–	–	–	–	–
BRCUSDC Current Wrong	F	T	0 Hz	0 Hz	0 Hz	–	0 Hz	0 Hz	0 Hz
Not Faulted	T	F	–	–	–	–	–	–	–
SXR Mode Ok	T	T	–	–	–	–	–	–	–

Where
A = `BEND_CLTS_180_ON_STATE`,
B = `BEND_CLTS_180_CURRENT_THRESHOLD`

33.81 Temperature RTD Summary: BSY Common Line

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `RTD_BSY0_16_CLINESUM_STATUS`

33.82 Timing / MPS Destination Mismatch

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
MISMATCH	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `LP_DESTINATION_MATCH`

33.83 Toroid Chassis LI24 IMBC2

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = CHASIMB2_STATE

33.84 Toroid Comparator BC2 (IMBC2IN vs IMBC2OUT)

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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

33.85 VVFS CLTH 101 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = VVFS_CLTH_101_OPEN_LIMSW_POSITION

33.86 VVFS LI21-9 Position (Station 22-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = FAST_VLV_OPEN_LI22_STATE

33.87 VVFS LI22-9 Position (Station 23-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FAST_VLV_OPEN_LI23_STATE`

33.88 VVFS LI23-9 Position (Station 24-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FAST_VLV_OPEN_LI24_STATE`

33.89 VVFS LI24-9 Position (Station 25-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FAST_VLV_OPEN_LI25_STATE`

33.90 VVFS LI25-9 Position (Station 26-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FAST_VLV_OPEN_LI26_STATE`

33.91 VVFS LI26-9 Position (Station 27-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FAST_VLV_OPEN_LI27_STATE`

33.92 VVFS LI27-9 Position (Station 28-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FAST_VLV_OPEN_LI28_STATE`

33.93 VVFS LI28-9 Position (Station 29-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FAST_VLV_OPEN_LI29_STATE`

33.94 VVFS LI29-9 Position (Station 30-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `FAST_VLV_OPEN_LI30_STATE`

33.95 VVPG CLTH 178 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `VVPG_CLTH_178_OPEN_LIMSW_POSITION`

33.96 VVPG CLTH 375 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	–	–	0 Hz	–	0 Hz	–	–
OK	T	–	–	120 Hz	–	120 Hz	–	–

Where
A = `VVPG_CLTH_375_OPEN_LIMSW_POSITION`

33.97 VVPG CLTS 372 POSITION

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_OPEN	F	–	–	–	–	–	0 Hz	0 Hz
OPEN	T	–	–	–	–	–	120 Hz	120 Hz

Where
A = `VVPG_CLTS_372_POSITION_STATE`

33.98 VVPG LI21-9 Position (Station 22-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `SLOW_VLV_OPEN_LI22_STATE`

33.99 VVPG LI22-9 Position (Station 23-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `SLOW_VLV_OPEN_LI23_STATE`

33.100 VVPG LI23-9 Position (Station 24-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `SLOW_VLV_OPEN_LI24_STATE`

33.101 VVPG LI24 710 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VV21_STATE`

33.102 VVPG LI24 896 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VV22_STATE`

33.103 VVPG LI25-9 Position (Station 26-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = SLOW_VLV_OPEN_LI26_STATE

33.104 VVPG LI26-9 Position (Station 27-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = SLOW_VLV_OPEN_LI27_STATE

33.105 VVPG LI27-9 Position (Station 28-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = SLOW_VLV_OPEN_LI28_STATE

33.106 VVPG LI28-9 Position (Station 29-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = SLOW_VLV_OPEN_LI29_STATE

33.107 VVPG LI29-9 Position (Station 30-1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = SLOW_VLV_OPEN_LI30_STATE

33.108 VVPG LI30-9 Position (Station 30-9)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = SLOW_VLV_30_9_OK_OPEN_STATE

34 Ignored when YAG01 Is In

34.1 BXG Status

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

34.2 Toroid Peak Current Monitor IM01

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `TR_BL215_STATE`

34.3 YAG02 IN20 241 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `YAGS_IN20_241_OUT_LMTSW_STATE`,
B = `YAGS_IN20_241_IN_LMTSW_STATE`

35 Ignored when YAG01 Is In or YAG02 Is In

35.1 BLM/PIC Watchdog Upstream of TDUND

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_MCC0_1_PICBLM_WD_STATUS`

35.2 BX01/BX02 Status

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

35.3 Flowswitch: CE11

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `COLL_LI21_235_OPEN_STATE`

35.4 Flowswitch: TD11

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = FS_BL305_STATE

35.5 Main Manifold Gauge: LI21 Station 5

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MPS_MM_GAUGE_OK_LI21_STATE

35.6 Mirror BL11 Position

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = MIR_BL11_OUT_STATE,
B = MIR_BL11_IN_STATE

35.7 OTR01 IN20 541 Position

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = OTRS_IN20_541_OUT_LMTSW_STATE,
B = OTRS_IN20_541_IN_LMTSW_STATE

35.8 OTR02 IN20 571 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `OTRS_IN20_571_OUT_LMTSW_STATE`,
B = `OTRS_IN20_571_IN_LMTSW_STATE`

35.9 OTR03 IN20 621 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `OTRS_IN20_621_OUT_LMTSW_STATE`,
B = `OTRS_IN20_621_IN_LMTSW_STATE`

35.10 OTR04 IN20 711 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `OTRS_IN20_711_OUT_LMTSW_STATE`,
B = `OTRS_IN20_711_IN_LMTSW_STATE`

35.11 OTR11 LI21 237 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `OTRS_LI21_237_OUT_LMTSW_STATE`,
B = `OTRS_LI21_237_IN_LMTSW_STATE`

35.12 OTR12 LI21 291 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `OTRS_LI21_291_OUT_LMTSW_STATE`,
B = `OTRS_LI21_291_IN_LMTSW_STATE`

35.13 OTRH1 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

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

35.14 OTRH2 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

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

35.15 Sub-booster Ready: LI21

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_SBST_OK_READY_LI21_STATE`

35.16 TD11 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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`

35.17 Toroid Chassis IN20 IM11

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = CHASIM11_STATE

35.18 Toroid Chassis IN20 IM12

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = CHASIM12_STATE

35.19 Toroid Comparator BC1 (IMBC1IN vs IMBC1OUT)

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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

35.20 VVFV IN20 785 Position

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = VVFV_IN20_785_OPEN_LMTSW_POSITION

35.21 VVPG IN20 155 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VV_BL155_STATE`

35.22 VVPG IN20 435 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VV_BL435_STATE`

35.23 VVPG IN20 545 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VV_BL545_STATE`

35.24 VVPG IN20 635 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VV_BL635_STATE`

35.25 VVPG IN20 915 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VV_IS915_STATE`

35.26 VVS Circuit Breaker: LI22

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VVS_BRKR_OK_READY_LI22_STATE`

35.27 VVS Circuit Breaker: LI24

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VVS_BRKR_OK_READY_LI24_STATE`

35.28 VVS Circuit Breaker: LI26

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VVS_BRKR_OK_READY_LI26_STATE`

35.29 VVS Circuit Breaker: LI28

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VVS_BRKR_OK_READY_LI28_STATE`

35.30 VVS Circuit Breaker: LI30

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VVS_BRKR_OK_READY_LI30_STATE`

35.31 YAG03 IN20 351 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `YAGS_IN20_351_OUT_LMTSW_STATE`,
B = `YAGS_IN20_351_IN_LMTSW_STATE`

35.32 YAGS1 IN20 921 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = YAGS_IN20_921_OUT_LMTSW_STATE,
B = YAGS_IN20_921_IN_LMTSW_STATE

35.33 YAGS2 IN20 995 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = YAGS_LI21_995_OUT_LMTSW_STATE,
B = YAGS_LI21_995_IN_LMTSW_STATE

36 Always Evaluated

36.1 Backward Beam Stopper (RST1)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Out	F	0 Hz	0 Hz	0 Hz	–	–	–	–
Out	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = `ST_BL551_STATE`

36.2 Beam Destination: HXR

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not True	F	–	–	–	–	–	–	–
True	T	–	–	–	–	–	–	–

Where
A = `LP_DESTINATION_HXR`

36.3 Beam Destination: SXR

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not True	F	–	–	–	–	–	–	–
True	T	–	–	–	–	–	–	–

Where
A = `LP_DESTINATION_SXR`

36.4 BLM/PIC Watchdog IN20

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_IN20_1_PICBLM_WD_STATUS`

36.5 Bypass Recover

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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

36.6 Gun RF Peak Power 20-6

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
OK	F	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
Fault	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = FLT_20_6_TRP_STATE

36.7 Gun Waveguide Vacuum Summary

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = WGVACGUN_STATE

36.8 HX2: 8 Hour Watchdog Timer

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Ok	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = HXRC_B969_1_TIMER_STATE

36.9 HX2: Recombiner 50% LEL Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Ok	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = HXRC_B969_1_RCBR_LEL_THRESHOLD

36.10 HX2: Room 50% LEL Threshold

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Faulted	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Ok	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = HXRC_B969_1_ROOM_LEL_THRESHOLD

36.11 IOC-IN20-MP01 MPS Support IOC Heartbeat

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = MN_HEART_STATE

36.12 Laser Heater Attenuator Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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

36.13 MCC Emergency Radiation Stopper

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not OK	F	0 Hz	0 Hz	0 Hz	0 Hz	0 Hz	0 Hz	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	120 Hz	120 Hz	120 Hz	120 Hz

Where
A = `EMG_RAD_STOP_STATE`

36.14 Mechanical Shutter Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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 = `MPS_IN20_200_MSHT1_OUT_FAULT`,
B = `MPS_IN20_200_MSHT1_IN_FAULT`

36.15 Mirror AM01 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Out	F	0 Hz	0 Hz	0 Hz	–	–	–	–
Out	T	120 Hz	120 Hz	120 Hz	–	–	–	–

Where
A = `MR_BL191_STATE`

36.16 MPS Beam Permit: BYKIK

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Permitted	F	–	–	0 Hz	–	–	–	–
Permitted	T	–	–	120 Hz	–	–	–	–

Where
A = `LP_ALLOWS_BEAM_BYKIK`

36.17 MPS Beam Permit: BYKIKS

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Permitted	F	–	–	–	–	–	–	0 Hz
Permitted	T	–	–	–	–	–	–	120 Hz

Where
A = LP_ALLOWS_BEAM_BYKIKS

36.18 MPS Beam Permit: Gun RF

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Permitted	F	0 Hz	–	–	–	–	–	–
Permitted	T	120 Hz	–	–	–	–	–	–

Where
A = LP_ALLOWS_BEAM_POCKELS_CELL

36.19 MPS Beam Permit: Gun RF HXR

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Permitted	F	–	–	–	–	0 Hz	–	–
Permitted	T	–	–	–	–	120 Hz	–	–

Where
A = LP_ALLOWS_BEAM_GUN_HXR

36.20 MPS Beam Permit: Gun RF SXR

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Permitted	F	–	–	–	–	–	0 Hz	–
Permitted	T	–	–	–	–	–	120 Hz	–

Where
A = LP_ALLOWS_BEAM_GUN_SXR

36.21 MPS Beam Permit: Heater Shutter

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Permitted	F	–	–	–	0 Hz	–	–	–
Permitted	T	–	–	–	120 Hz	–	–	–

Where
A = LP_ALLOWS_BEAM_LH_SHUT

36.22 MPS Beam Permit: Mechanical Shutter

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Permitted	F	–	0 Hz	–	–	–	–	–
Permitted	T	–	120 Hz	–	–	–	–	–

Where
A = LP_ALLOWS_BEAM_MECH_SHUT

36.23 MPS Mechanical Shutter Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
OK	F	120 Hz	120 Hz	120 Hz	–	–	–	–
Readback Does Not Match	T	0 Hz	0 Hz	0 Hz	–	–	–	–

Where
A = SHFLT_STATE

36.24 PIC HVPS LI20 - Location LKG-1535

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
NOT_ON	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
ON	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = PICM_LI20_1_HV_PWR_STATE

36.25 PIC Raw Charge Thresholds: IN20 185

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

Where
A = `PICM_IN20_185_LOSSL_THRESHOLD`,
B = `PICM_IN20_185_LOSSH_THRESHOLD`

36.26 PIC Raw Charge Thresholds: IN20 232

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

Where
A = `PICM_IN20_232_LOSSL_THRESHOLD`,
B = `PICM_IN20_232_LOSSH_THRESHOLD`

36.27 PIC Raw Charge Thresholds: IN20 245

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

Where
A = `PICM_IN20_245_LOSSL_THRESHOLD`,
B = `PICM_IN20_245_LOSSH_THRESHOLD`

36.28 PIC Raw Charge Thresholds: IN20 665

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

Where
A = `PICM_IN20_665_LOSSL_THRESHOLD`,
B = `PICM_IN20_665_LOSSH_THRESHOLD`

36.29 PIC Raw Charge Thresholds: IN20 775

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

Where
A = `PICM_IN20_775_LOSSL_THRESHOLD`,
B = `PICM_IN20_775_LOSSH_THRESHOLD`

36.30 PIC Raw Charge Thresholds: IN20 933

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

Where
A = `PICM_IN20_933_LOSSL_THRESHOLD`,
B = `PICM_IN20_933_LOSSH_THRESHOLD`

36.31 PIC Trigger Missed (LN11)

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `PICM_IN20_665_NO_TRIG_MISSED`

36.32 Pockels Cell AND Gate 100

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_IN20_100_ANDALLACTV_STATE`

36.33 Pockels Cell AND Gate 200

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `MPS_IN20_200_ANDALLACTV_STATE`

36.34 Rate Request: BYKIK 1 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	120 Hz	–	–	–	–
Requested	T	–	–	1 Hz	–	–	–	–

Where
A = `LP_MAX_RATE_BYKIK_1_HZ`

36.35 Rate Request: BYKIK 10 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	120 Hz	–	–	–	–
Requested	T	–	–	10 Hz	–	–	–	–

Where
A = `LP_MAX_RATE_BYKIK_10_HZ`

36.36 Rate Request: BYKIK 30 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	120 Hz	–	–	–	–
Requested	T	–	–	30 Hz	–	–	–	–

Where
A = `LP_MAX_RATE_BYKIK_30_HZ`

36.37 Rate Request: BYKIK 60 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	120 Hz	–	–	–	–
Requested	T	–	–	60 Hz	–	–	–	–

Where
A = `LP_MAX_RATE_BYKIK_60_HZ`

36.38 Rate Request: BYKIK Burst

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	120 Hz	–	–	–	–
Requested	T	–	–	Burst Mode	–	–	–	–

Where
A = `LP_MAX_RATE_BYKIK_BURST`

36.39 Rate Request: BYKIK Single Shot

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	120 Hz	–	–	–	–
Requested	T	–	–	Single Shot	–	–	–	–

Where
A = LP_MAX_RATE_BYKIK_SINGLE_SHOT

36.40 Rate Request: BYKIKS 1 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	–	120 Hz
Requested	T	–	–	–	–	–	–	1 Hz

Where
A = LP_MAX_RATE_BYKIKS_1_HZ

36.41 Rate Request: BYKIKS 10 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	–	120 Hz
Requested	T	–	–	–	–	–	–	10 Hz

Where
A = LP_MAX_RATE_BYKIKS_10_HZ

36.42 Rate Request: BYKIKS 30 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	–	120 Hz
Requested	T	–	–	–	–	–	–	30 Hz

Where
A = LP_MAX_RATE_BYKIKS_30_HZ

36.43 Rate Request: BYKIKS 60 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	–	120 Hz
Requested	T	–	–	–	–	–	–	60 Hz

Where
A = LP_MAX_RATE_BYKIKS_60_HZ

36.44 Rate Request: BYKIKS Burst

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	–	120 Hz
Requested	T	–	–	–	–	–	–	Burst Mode

Where
A = LP_MAX_RATE_BYKIKS_BURST

36.45 Rate Request: BYKIKS Single Shot

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	–	120 Hz
Requested	T	–	–	–	–	–	–	Single Shot

Where
A = LP_MAX_RATE_BYKIKS_SINGLE_SHOT

36.46 Rate Request: Gun RF HXR 1 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	120 Hz	–	–
Requested	T	–	–	–	–	1 Hz	–	–

Where
A = LP_MAX_RATE_GUN_HXR_1_HZ

36.47 Rate Request: Gun RF HXR 10 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	120 Hz	–	–
Requested	T	–	–	–	–	10 Hz	–	–

Where
A = LP_MAX_RATE_GUN_HXR_10_HZ

36.48 Rate Request: Gun RF HXR 30 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	120 Hz	–	–
Requested	T	–	–	–	–	30 Hz	–	–

Where
A = LP_MAX_RATE_GUN_HXR_30_HZ

36.49 Rate Request: Gun RF HXR 60 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	120 Hz	–	–
Requested	T	–	–	–	–	60 Hz	–	–

Where
A = LP_MAX_RATE_GUN_HXR_60_HZ

36.50 Rate Request: Gun RF HXR Burst

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	120 Hz	–	–
Requested	T	–	–	–	–	Burst Mode	–	–

Where
A = LP_MAX_RATE_GUN_HXR_BURST

36.51 Rate Request: Gun RF HXR Single Shot

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	120 Hz	–	–
Requested	T	–	–	–	–	Single Shot	–	–

Where
A = LP_MAX_RATE_GUN_HXR_SINGLE_SHOT

36.52 Rate Request: Gun RF SXR 1 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	120 Hz	–
Requested	T	–	–	–	–	–	1 Hz	–

Where
A = LP_MAX_RATE_GUN_SXR_1_HZ

36.53 Rate Request: Gun RF SXR 10 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	120 Hz	–
Requested	T	–	–	–	–	–	10 Hz	–

Where
A = LP_MAX_RATE_GUN_SXR_10_HZ

36.54 Rate Request: Gun RF SXR 30 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	120 Hz	–
Requested	T	–	–	–	–	–	30 Hz	–

Where
A = LP_MAX_RATE_GUN_SXR_30_HZ

36.55 Rate Request: Gun RF SXR 60 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	120 Hz	–
Requested	T	–	–	–	–	–	60 Hz	–

Where
A = LP_MAX_RATE_GUN_SXR_60_HZ

36.56 Rate Request: Gun RF SXR Burst

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	120 Hz	–
Requested	T	–	–	–	–	–	Burst Mode	–

Where
A = LP_MAX_RATE_GUN_SXR_BURST

36.57 Rate Request: Gun RF SXR Single Shot

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	–	–	–	–	–	120 Hz	–
Requested	T	–	–	–	–	–	Single Shot	–

Where
A = LP_MAX_RATE_GUN_SXR_SINGLE_SHOT

36.58 Rate Request: Pockels Cell 1 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	120 Hz	–	–	–	–	–	–
Requested	T	1 Hz	–	–	–	–	–	–

Where
A = LP_MAX_RATE_PC_1_HZ

36.59 Rate Request: Pockels Cell 10 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	120 Hz	–	–	–	–	–	–
Requested	T	10 Hz	–	–	–	–	–	–

Where
A = LP_MAX_RATE_PC_10_HZ

36.60 Rate Request: Pockels Cell 30 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	120 Hz	–	–	–	–	–	–
Requested	T	30 Hz	–	–	–	–	–	–

Where
A = LP_MAX_RATE_PC_30_HZ

36.61 Rate Request: Pockels Cell 60 Hz

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	120 Hz	–	–	–	–	–	–
Requested	T	60 Hz	–	–	–	–	–	–

Where
A = LP_MAX_RATE_PC_60_HZ

36.62 Rate Request: Pockels Cell Burst

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	120 Hz	–	–	–	–	–	–
Requested	T	Burst Mode	–	–	–	–	–	–

Where
A = LP_MAX_RATE_PC_BURST

36.63 Rate Request: Pockels Cell Single Shot

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not Requested	F	120 Hz	–	–	–	–	–	–
Requested	T	Single Shot	–	–	–	–	–	–

Where
A = `LP_MAX_RATE_PC_SINGLE_SHOT`

36.64 VVMG IN20 175 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VV_BL175_STATE`

36.65 VVMG LI21 195 Position

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VV_BL195_STATE`

36.66 VVS Circuit Breaker: LI20

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
FAULT	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
OK	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz

Where
A = `VVS_BRKR_OK_READY_LI20_STATE`

36.67 YAG01 IN20 211 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `YAGS_IN20_211_OUT_LMTSW_STATE`,
B = `YAGS_IN20_211_IN_LMTSW_STATE`

36.68 YAGG1 IN20 841 Position

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Moving	F	F	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz
Out	F	T	120 Hz	120 Hz	120 Hz	–	–	–	120 Hz
In	T	F	10 Hz	10 Hz	10 Hz	–	–	–	10 Hz
Broken	T	T	0 Hz	0 Hz	0 Hz	–	–	–	0 Hz

Where
A = `YAGS_IN20_841_OUT_LMTSW_STATE`,
B = `YAGS_IN20_841_IN_LMTSW_STATE`

37 Ignore Logic

37.1 A-Line Kicker Is Not Enabled

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Is Not Enabled	F	F	–	–	–	–	–	–	–

Where
A = KICK_BSY0_66_PM1_TRIG_ENB_STATUS,
B = KICK_BSY0_66_PM2_TRIG_ENB_STATUS

37.2 A-Line SL10 Is Closed

Name	*D*	*C*	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
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

37.3 BKRCUS Is On

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
On	T	–	–	–	–	–	–	–

Where
A = KICK_CLTS_185_ON_STATE

37.4 BRCUSDC Is Off

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Off	T	–	–	–	–	–	–	–

Where
A = BEND_CLTS_180_OFF_STATE

37.5 BRCUSDC Is On

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
On	T	–	–	–	–	–	–	–

Where
A = BEND_CLTS_180_ON_STATE

37.6 BX01/BX02 Is Off

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Off	F	T	–	–	–	–	–	–	–

Where
A = BEND_IN20_751_OFF_STATE,
B = BEND_IN20_751_OK_STATE

37.7 BX01/BX02 Is On

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
On	T	F	–	–	–	–	–	–	–

Where
A = BEND_IN20_751_OFF_STATE,
B = BEND_IN20_751_OK_STATE

37.8 BXG Is Off

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Off	F	T	–	–	–	–	–	–	–

Where
A = BEND_IN20_231_OFF_STATE,
B = BEND_IN20_231_OK_STATE

37.9 BXG Is On

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
On	T	F	–	–	–	–	–	–	–

Where
A = BEND_IN20_231_OFF_STATE,
B = BEND_IN20_231_OK_STATE

37.10 Destination HXR

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
HXR	T	–	–	–	–	–	–	–

Where
A = LP_DESTINATION_HXR

37.11 Destination SXR

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
SXR	T	–	–	–	–	–	–	–

Where
A = LP_DESTINATION_SXR

37.12 Diag Stopper HFX DG2 Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = HFX_DG2_STP_01_IN_DI_POSITION

37.13 Diag Stopper HFX UM6 Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = HFX_UM6_STP_01_IN_DI_POSITION

37.14 Diag Stopper XCS SB1 Is In

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = XCS_SB1_STP_01_CLS_DI_POSITION

37.15 HXR Beamline is in SC Mode

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
SC Mode	T	–	–	–	–	–	–	–

Where
A = MPS_UNDH_1_FACMODE_STATE

37.16 Laser Heater Attenuator Is In

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = LHATTEN_IN_LIMIT_STATE

37.17 LTU Dechirper Is Out

Name	D	C	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Out	T	T	T	T	–	–	–	–	–	–	–

Where
A = DCHP_LTUH_545_OUT_LIMSW_NEGY_POSITION,
B = DCHP_LTUH_545_OUT_LIMSW_POSY_POSITION,
C = DCHP_LTUH_555_OUT_LIMSW_NEGX_POSITION,
D = DCHP_LTUH_555_OUT_LIMSW_POSX_POSITION

37.18 MR1K1 Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Is In	T	–	–	–	–	–	–	–

Where
A = STPR_FEES_MR1K1_IN_STATE

37.19 MR1K1 Is Out

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Is Out	T	–	–	–	–	–	–	–

Where
A = MIRR_FEES_MR1K1_OUT_POSITION

37.20 ST1K2 Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Is In	T	–	–	–	–	–	–	–

Where
A = STPR_FEES_ST1K2_IN_STATE

37.21 ST3K4 Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Is In	T	–	–	–	–	–	–	–

Where
A = STPR_FEES_ST1K4_IN_STATE

37.22 STCLTS Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = STPR_CLTS_585_IN_LIMIT_POSITION

37.23 Stopper MFX S4.5 Is In

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Is In	T	–	–	–	–	–	–	–

Where
A = STPR_XRT_1_S45IN_STATE

37.24 Stopper S5B Is In

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = STPR_FEH1_5_S5BIN_POSITION

37.25 Stopper SH2 Is In

Name	B	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	F	–	–	–	–	–	–	–

Where
A = STPR_XRT1_1_SH2OUT_STATE,
B = STPR_XRT1_1_SH2IN_STATE

37.26 Stopper ST1L0 Is In

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = STPR_FEE1_ST1_IN_POSITION

37.27 Stopper XRT S5 Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = STPR_XRT1_1_S5IN_POSITION

37.28 Stopper XRT S6 Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = STPR_XRT1_1_S6IN_POSITION

37.29 Stopper: BSY D2 Summary Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = STPR_BSYH_847_IN_LIMIT_POSITION

37.30 SXR Beamline is in SC Mode

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
SC Mode	T	–	–	–	–	–	–	–

Where
A = MPS_UNDS_1_FACMODE_STATE

37.31 SXR Wire Scanner Mode Disabled

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Disabled	F	–	–	–	–	–	–	–

Where
A = LP_SXR_WS_MODE

37.32 SXR Wire Scanner Mode Enabled

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Enabled	T	–	–	–	–	–	–	–

Where
A = LP_SXR_WS_MODE

37.33 SXRSS M1/Grating Is Out

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
	T	–	–	–	–	–	–	–

Where
A = MIRR_UNDS_3520_OUT_LIMIT_POSITION

37.34 TD11 Is In

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = TD11_IN_LIMIT_STATE

37.35 TDUND Is In

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = DUMP_LTUH_970_IN_LIMIT_POSITION

37.36 TDUNDB Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = DUMP_LTUS_972_IN_LIMIT_POSITION

37.37 XPP-NH3-POS-00 Beamline Is In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = XPP_NH3_POS_00_IN_STATE

37.38 XPP-NH3-POS-00 Beamline Is Not In

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
Not_IN	F	–	–	–	–	–	–	–

Where
A = XPP_NH3_POS_00_IN_STATE

37.39 XRT-M2 Mirror Is Out of Beam

Name	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
IS_OUT	T	–	–	–	–	–	–	–

Where
A = HXX_HXM_MMS_01_B_POSITION

37.40 YAG01 Is In

Name	*B*	*A*	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	F	–	–	–	–	–	–	–

Where
A = YAGS_IN20_211_OUT_LMTSW_STATE,
B = YAGS_IN20_211_IN_LMTSW_STATE

37.41 YAG02 Is In

Name	A	GUNL	MS	BYKIK	LHS	GUNH	GUNS	BYKIKS
In	T	–	–	–	–	–	–	–

Where
A = YAGS_IN20_241_IN_LMTSW_STATE