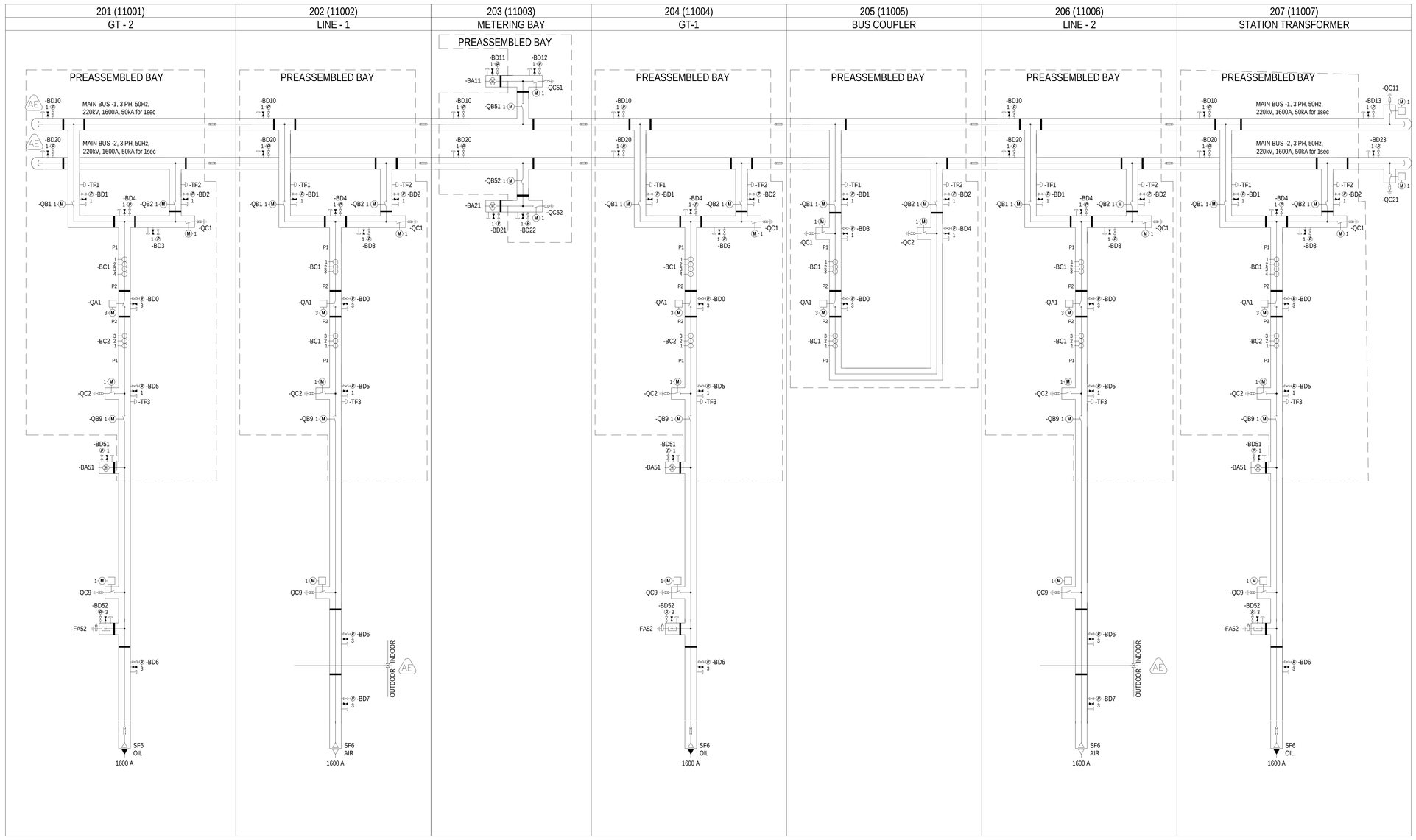

LEGEND

		QUANTITY (Nos)
	- CIRCUIT BREAKER / OPERATING MECHANISM (3 MOTORS FOR 3 PHASES) (SINGLE POLE) -QA1	18
	- DISCONNECTOR (1 MOTOR FOR 3 PHASES) (THREE POLE) -QB1, -QB2, -QB9, -QB51, -QB52	19
	- MAINTENANCE EARTHING SWITCH WITH 10 kV INSULATION (1 MOTOR FOR 3 PHASES) (THREE POLE) -QC1, -QC2, -QC51, -QC52	14
	- HIGH SPEED EARTHING SWITCH WITH 10 kV INSULATION (1 MOTOR FOR 3 PHASES) (THREE POLE) -QC9, -QC11, -QC21	7
	- CURRENT TRANSFORMER (SINGLE POLE) (CT CORES AND SECONDARY WINDINGS ARE SITUATED OUTSIDE THE GAS COMPARTMENT) -BC1, - BC2	36
	- VOLTAGE TRANSFORMER (THREE POLE) -BA11, - BA21, -BA51	5
	- SURGE ARRESTER (SINGLE POLE) -FA52	9
SF6 AIR	- SF6 TO AIR BUSHING	6
SF6 OIL	- TRANSFORMER CONNECTION	9
	- REMOVABLE LINK / LATERAL DISMANTLING PIECE	36
	- END COVER	6
	- PARTITION INSULATOR	210
	- SF6 CONNECTION (GAS FILLING POINT)	98
	- PRESSURE RELIEF DEVICE WITH ADSORBENT	100
-BDXX	- GAS DENSITY MONITOR	98

REFERENCE DOCUMENTS

PLEASE REFER TO DOCUMENT LIST	1HYG900036-6	PROJECT SPECIFIC PARAMETERS

REV	DATE	NAME	MODIFICATION
AE	06/07/2019	DHRUVI S	MODIFIED THE SURGE ARRESTER RATING
AD	29/03/2019	BHAVIN S	BAY SEQUENCE AND CT PARAMETER MODIFIED.
AC	30/10/2018	BHAVIN S	MODIFIED AS PER LAYOUT
AB	11/10/2018	BHAVIN S	MODIFIED AS PER CUSTOMER COMMENTS
AA	01/10/2018	BHAVIN S	PRELIMINARY

CLIENT:	M/S BHARAT HEAVY ELECTRICAL LIMITED
END CUSTOMER:	UTTARAKHAND JAL VIDHYUT NIGAM LIMITED (UJVNL)
PROJECT:	220 kV GIS for 2 x 60 MW VYASI HEP AT VYASI, DIST DEHRADHUN, UK
NOA No:	**136/E & M DESIGN-I/Vy-EPC(6) (FOR SUPPLY) dt 15.04.2014 & 137/E & M DESIGN-I/Vy-EPC(6) (FOR SERVICES) dt15.04.2014**
BHEL Doc No:	TB-3-398-316-101

FOR APPROVAL

Draft: 06.07.2019 DHRUVI S	Derived from: -	Separate BOM: -	Scale: NTS	Doc.type: DW1	Format: A0
Approved: 06.07.2019 DEBASISH M	Replaces: -	SF6 SWITCHGEAR ELK-14C 220 kV GIS for 2 x 60 MW VYASI HEP.			
Released: 06.07.2019 DHRUVI S	Responsible department: PGHV-GIS				Language: EN
Order number: 3100094055	Revision: AE	SINGLE LINE & GAS DIAGRAM			No. Sheets: 002
ABB India Ltd under license of ABB Technology Ltd		Document number: 1HYG900036-1			Sheet no.: 001

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SF6 GAS PRESSURES

AE

SF6 GAS PRESSURES ABSOLUTE AT 20°C		CIRCUIT BREAKER	VOLTAGE TRANSFORMER	OTHER GAS COMPARTMENT (BAYS)	GAS COMPARTMENTS EXIT BUSDUCT (INDOOR)	GAS COMPARTMENT EXIT BUSDUCTS (OUTDOOR)
FILLING PRESSURE - DENSITY		680 kPa - 45.0 g/dm³	780 kPa - 52.4 g/dm³	680 kPa - 45.0 g/dm³	530 kPa - 34.2 g/dm³	680 kPa - 45.0 g/dm³
MINIMUM PRESSURE - DENSITY		600 kPa - 39.2 g/dm³	700 kPa - 46.4 g/dm³	600 kPa - 39.2 g/dm³	450 kPa - 28.7 g/dm³	600 kPa - 39.2 g/dm³
MINIMUM RESPONSE PRESSURES FOR DENSITY MONITOR	CONTACT 1: ALARM 1	620 kPa	720 kPa	620 kPa	470 kPa	620 kPa
	CONTACT 2: BLOCK TC1 /ALARM 2	600 kPa	700 kPa	600 kPa	450 kPa	600 kPa
	CONTACT 3: BLOCK TC2	600 kPa	-	-	-	-

CURRENT TRANSFORMERS

DESIGNATION	CORE No.	RATIO	CLASS	TYPE	BURDEN	Icth	Rct (Ω)	MIN. Ual (V)	Ial AT Ual (mA)	NOTES
=201, =204,	1	800-400/1A	PS	PROTECTION	-	120 %	4-2	800-400	60-120	RATING PLATE: 1HYG910036 QUANTITY: 6 CORE SEQUENCE: P1-1-2-3-4-P2 (INSULATION AT P2)
	2	800-400/1A	PS	PROTECTION	-	120 %	4-2	800-400	60-120	
	3	800-400/1A	PS	PROTECTION	-	120 %	4-2	800-400	60-120	
-BC1	4	800-400/1A	PS	PROTECTION	-	120 %	4-2	800-400	60-120	

CURRENT TRANSFORMERS

DESIGNATION	CORE No.	RATIO	CLASS	TYPE	BURDEN	Icth	Rct (Ω)	MIN. Ual (V)	Ial AT Ual (mA)	NOTES
=202, =205, =206	1	1600-800-400/1A	PS	PROTECTION	-	120 %	8-4-2	1600-800-400	30-60-120	RATING PLATE: 1HYG920036 QUANTITY: 18 CORE SEQUENCE: P1-1-2-3-P2 (INSULATION AT P2)
	2	1600-800-400/1A	PS	PROTECTION	-	120 %	8-4-2	1600-800-400	30-60-120	
	3	1600-800-400/1A	0.2S	METERING	25	120 %	-	-	-	
-BC1	-	-	-	-	-	-	-	-	-	

CURRENT TRANSFORMERS

DESIGNATION	CORE No.	RATIO	CLASS	TYPE	BURDEN	Icth	Rct (Ω)	MIN. Ual (V)	Ial AT Ual (mA)	NOTES
=201, =204	1	1600-800/1A	PS	PROTECTION	-	120 %	8-4	1600-800	30-60	RATING PLATE: 1HYG930036 QUANTITY: 6 CORE SEQUENCE: P1-1-2-3-P2 (INSULATION AT P2)
	2	1600-800/1A	PS	PROTECTION	-	120 %	8-4	1600-800	30-60	
	3	800-400/1A	0.2S	METERING	25	120 %	-	-	-	
- BC2	-	-	-	-	-	-	-	-	-	

CURRENT TRANSFORMERS

DESIGNATION	CORE No.	RATIO	CLASS	TYPE	BURDEN	Icth	Rct (Ω)	MIN. Ual (V)	Ial AT Ual (mA)	NOTES
=207	1	1600-800/1A	PS	PROTECTION	-	120 %	8-4	1600-800	30-60	RATING PLATE: 1HYG940036 QUANTITY: 3 CORE SEQUENCE: P1-1-2-3-P2 (INSULATION AT P2)
	2	1600-800/1A	PS	PROTECTION	-	120 %	8-4	1600-800	30-60	
	3	200-100/1A	0.2S - 0.5	METERING	5-2.5	120 %	-	-	-	
- BC2	-	-	-	-	-	-	-	-	-	

CURRENT TRANSFORMERS

DESIGNATION	CORE No.	RATIO	CLASS	TYPE	BURDEN	Icth	Rct (Ω)	MIN. Ual (V)	Ial AT Ual (mA)	NOTES
=207	1	200-100/1A	PS	PROTECTION	-	120 %	4-2	200-100	350-700	RATING PLATE: 1HYG950036 QUANTITY: 3 CORE SEQUENCE: P1-1-2-3-4-P2 (INSULATION AT P2)
	2	200-100/1A	PS	PROTECTION	-	120 %	4-2	200-100	350-700	
	3	200-100/1A	PS	PROTECTION	-	120 %	4-2	200-100	350-700	
-BC1	4	200-100/1A	PS	PROTECTION	-	120 %	4-2	200-100	350-700	

VOLTAGE TRANSFORMERS

DESIGNATION	WINDINGS	RATIO	CLASS	TYPE	BURDEN	NOTES
=201, =203 =204, =207 AE	PRIMARY	220 kV / √3				RATING PLATE: 1HYG901036 QUANTITY: 5
-BA11 -BA21 -BA51	SECONDARY 1	110 V / √3	3P	PROTECTION	50 VA	
	SECONDARY 2	110V / √3	3P	PROTECTION	50 VA	
	SECONDARY 3	110 V / √3	0.2	METERING	50 VA	

SURGE ARRESTER AE

DESIGNATION	SURGE ARRESTER DATA				NOTES
=201, =204 =207	RATED VOLTAGE FOR SURGE ARRESTER		Ur	198 kV	RATING PLATE: 1HYG900136 QUANTITY: 9
	MAXIMUM CONTINUOUS OPERATING VOLTAGE		Uc	158 kV	
	NOMINAL DISCHARGE CURRENT		In	10 kA	
	LINE DISCHARGE CLASS		LD	3	
	PEAK RESIDUAL VOLTAGE OF SWITCHING IMPULSE	(30/60 µs) @ 1 kA		382 kV	
	PEAK RESIDUAL VOLTAGE OF LIGHTNING IMPULSE	(8/20 µs) @ 10 kA		476 kV	
-FA52	PEAK RESIDUAL VOLTAGE OF STEP WAVE IMPULSE	(1/9 µs) @ 5 kA		483 kV	

LEGEND

		QUANTITY (Nos)
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