



COMMENT RESOLUTION SHEET			
DRG / DOC TITLE		Gas System Diagram 400kV GIS - Single Line Diagram	
NTPC DRG / DOC NO.		9585-001-572-PVE-B-0290	
Revision		1	
Reviewed By		NTPC	
Review Date / Location		03-04-2019 / NTPCEOC	
400kV GIS Switchyard			
SR. No.	Page No. / Clause No. / Sheet No.	NTPC Observations / Comments	Vendor Reply
1	Sheet 2	Refer comment sheet Sr. No.-8	We confirmed. Insulation Co-ordination study has been submitted separately.
2	Sheet 3	Total Quantity (Volume) and Weight of Gas (kg) in GIS need to be mentioned in next revision.	According to approved GIS Layout (Plan & Section View), we have revised the Gas System Diagram accordingly.
3	Sheet 3	This is required for monitoring the total leakage of the GAS (which should be less than 0.1% per year as per standard)	<div>According to IEC 62271-203 2011 clause 5.15.2 (as following picture) and IEC 62271-1 2017 clause 6.16.3, the leakage rate of GIS gas compartment should not exceed 0.5% per year.</div> <div>5.15.2 Closed pressure systems for gas Subclause 5.15.2 of IEC 62271-1 is applicable with the following addition: The leakage rate from any single compartment of GIS to atmosphere and between compartments shall not exceed <u>0.5 %</u> per year for the service lifetime of the equipment.</div> <div>As per technical specification clause 2.03.10 (as following picture), the leakage rate of GIS gas compartment also shall no exceed 0.5% per year.</div> <div><div>2.03.10</div><div>The maximum SF6 gas leakage shall not exceed half percent (0.5%) per year for the whole equipments and for any individual gas compartment separately.</div></div>

INVENTORY No.



SF6 DENSITY SETTING (Relative @ 20°C)				
Compartment Area	Nominal pressure	Gas Re-fill pressure	Low alarm pressure	Lockout pressure
CB	0.68Mpa	0.65Mpa	0.63Mpa	0.60Mpa
Others	0.58Mpa	0.55Mpa	0.53Mpa	
Note: 1Mpa=10bar				

REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED			
ZONE			ZONE			ZONE			ZONE			ZONE			ZONE			ZONE			ZONE			ZONE			ZONE			ZONE		
																02	15042019	HG FAN YQ DONG APPROVED YZ CAO														
Revise the drawing as the comments dated on 10042019																																

CA NO.		01/PVUNIL-CS-9585-001-2/NDA-FC DATED 08/03/2018 01/PVUNIL-CS-9585-001-2/NDA-SC DATED 08/03/2018 01/PVUNIL-CS-9585-001-2/NDA-DATED 08/03/2018										
ADDITIONAL INFORMATION W.O.No.		प्राहक/परियोजना का नाम		PATRATRU VIDYUT UTPADAN NIGAM LTD. PATRATRU SUPER THERMAL POWER								
STATUS OF DRAWING		NAME OF CUSTOMER/PROJECT		PROJECT EXPANSION PHASE-I (3x800 MW)								
DISTRIBUTION OF PRINTS		<div><div></div><div>भारत हेवी इलेक्ट्रिकल्स लिमिटेड मुख्यालय परियोजना विभाग BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION</div></div>		<div><div>क्रमांक / DRAWN</div><div>रजि. CHECKED</div><div>नियंत्रित APPROVED</div></div>		<div>नाम /NAME</div> <div>HG FAN</div> <div>YQ DONG</div> <div>YZ CAO</div>		<div>हस्ता./SIGN.</div> <div>हरेश्वर</div> <div>यु योंग</div> <div>यू चो</div>		<div>दि./DATE</div> <div>17-01-2019</div> <div>17-01-2019</div> <div>17-01-2019</div>		
REV.	DATE	ALTERED	HG FAN	विभागा DEPT.		अनुपात / SCALE	कार्ड कोड CARD CODE	VENDOR				
01	16032019	CHECKED	YQ DONG	कोड CODE				Sieyuan Electric Co., Ltd.				
ZONE		APPROVED		YZ CAO								
Revise the drawing as the comments dated on 07/220219				शोधक/TITLE				डाटाई. क्र./DRAWING NO.				
				GAS SYSTEM DIAGRAM 400kV GIS - SINGLE LINE DIAGRAM				भूमि. प्र. क्र./ SHEET No. 01				
								आदेश क्र./ORDER NO. 9585-001-572-PVE-B-0290				
								ड्राइंग क्र./DRAWING NO. TB-397-316-GIS-001				
								पुनः/REV. 02				

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)																									
0620-B-E\A-P-572-PVE-001-9585-001																									

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BAY410			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₀ (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (busbar)	R	1.18	53.2
	Y	1.17	52.7
	B	1.18	53.2
BP ₂ (DS1+ES1+CT1)	R	0.13	5.9
	Y	0.13	5.9
	B	0.13	5.9
BP ₃ (DS2+ES2+CT2+busbar)	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
BP ₄ (DS9+ES9+FES8+busbar)	R	0.735	33
	Y	0.735	33
	B	0.735	33
BP ₅ (busbar)	R	2.900	130.2
	Y	2.757	123.8
	B	2.613	117.3
BP ₆ (busbar)	R	0.871	39.1
	Y	1.691	75.9
	B	2.510	112.7
Total		22.734	1028.6

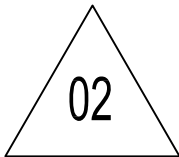
BAY413			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₁ (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (busbar)	R	1.18	53.2
	Y	1.17	52.7
	B	1.18	53.2
BP ₂ (DS1+ES1+CT1)	R	0.13	5.9
	Y	0.13	5.9
	B	0.13	5.9
BP ₂ (DS2+ES2+CT2+busbar)	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
BP ₂ (DS9+ES9+FES3+busbar)	R	0.735	33
	Y	0.735	33
	B	0.735	33
BP ₃ (busbar)	R	3.452	155.0
	Y	3.309	148.6
	B	3.166	142.2
BP ₃ (busbar)	R	1.974	88.6
	Y	2.794	125.4
	B	3.614	162.3
Total		17.701	1252.7

BAY416			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP _i (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP _i (busbar)	R	1.18	53.2
	Y	1.17	52.7
	B	1.18	53.2
BP _i (DS1+ES1+CT1)	R	0.13	5.9
	Y	0.13	5.9
	B	0.13	5.9
BP _i (DS2+ES2+CT2+busbar)	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
BP _i (DS9+ES9+FES8+busbar)	R	0.735	33
	Y	0.735	33
	B	0.735	33
BP _i (busbar)	R	2.922	131.2
	Y	2.779	124.8
	B	2.636	118.3
BP _i (busbar)	R	2.667	119.8
	Y	2.667	119.8
	B	2.667	119.8
BP _i (busbar)	R	1.493	67.0
	Y	2.313	103.8
	B	3.133	140.7
Total		32.669	1475.8

BAY419			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₁ (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (busbar)	R	1.18	53.2
	Y	1.17	52.7
	B	1.18	53.2
BP ₂ (DS1+ES1+CT1)	R	0.13	5.9
	Y	0.13	5.9
	B	0.13	5.9
BP ₂ (DS2+ES2+CT2+busbar)	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
BP ₄ (DS9+ES9+FES8+busbar)	R	0.735	33
	Y	0.735	33
	B	0.735	33
BP ₃ (busbar)	R	3.183	142.9
	Y	3.040	136.5
	B	2.897	130.1
BP ₃ (busbar)	R	2.940	132.0
	Y	2.940	132.0
	B	2.940	132.0
BP ₇ (busbar)	R	2.489	111.7
	Y	2.489	111.7
	B	2.489	111.7
BP ₃ (busbar)	R	0.869	39.0
	Y	1.689	75.9
	B	2.509	112.7
Total		39.866	1798.8

BAY421A / BAY 421B			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP _i (busbar)	R	0.88	39.3
	Y	0.86	38.8
	B	0.88	39.3
BP _i (SA1)	R	0.578	26
	Y	0.578	26
	B	0.578	26
BP _i (DS1+ES1+ FES1+busbar)	R	0.106	4.8
	Y	0.106	4.8
	B	0.106	4.8
BP _i (VT1)	R	0.46	20.7
	Y	0.46	20.7
	B	0.46	20.7
BP _i (VT2)	R	0.46	20.7
	Y	0.46	20.7
	B	0.46	20.7
BP _i (DS2+ES2+ FES2+busbar)	R	0.106	4.8
	Y	0.106	4.8
	B	0.106	4.8
BP _i (SA1)	R	0.578	26
	Y	0.578	26
	B	0.578	26
BP _i (busbar)	R	0.60	27.1
	Y	0.59	26.6
	B	0.60	27.1
Total		11.274	507.2

The total weight of SF₆ gas is 19680.9 kg.
The total Volume of SF₆ gas is 424.276 m³



BAY411			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₀ (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (DS1+ES1+ CT1+busbar)	R	0.221	9.9
	Y	0.221	9.9
	B	0.221	9.9
BP ₂ (DS2+ES2+ CT2+busbar)	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
Total		3.93	184.5

BAY414			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₁ (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (DS1+ES1+ CT1+busbar)	R	0.221	9.9
	Y	0.221	9.9
	B	0.221	9.9
BP ₁ (DS2+ES2+ CT2+busbar)	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
Total		3.93	184.5

BAY417			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₀ (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (DS1+ES1+ CT1+busbar)	R	0.221	9.9
	Y	0.221	9.9
BP ₂ (DS2+ES2+ CT2+busbar)	B	0.221	9.9
	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
Total		3.93	184.5

BAY420			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₁ (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (DS1+ES1+ CT1+busbar)	R	0.221	9.9
	Y	0.221	9.9
BP ₁ (DS2+ES2+ CT2+busbar)	B	0.221	9.9
	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
	Total	3.93	184.5

BAY412			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₀ (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (busbar)	R	1.18	53.2
	Y	1.17	52.7
	B	1.18	53.2
BP ₂ (DS1+ES1+CT1)	R	0.13	5.9
	Y	0.13	5.9
	B	0.13	5.9
BP ₁ (DS2+ES2+ CT2+busbar)	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
BP ₁ (DS9+ES9+ FES8+busbar)	R	0.735	33
	Y	0.735	33
	B	0.735	33
BP ₅ (busbar)	R	3.504	157.3
	Y	2.827	126.9
	B	2.150	96.5
Total		17.873	811.3



BAY415			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₁ (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (bustbar)	R	1.18	53.2
	Y	1.17	52.7
	B	1.18	53.2
BP ₂ (DS1+ES1+CT1)	R	0.13	5.9
	Y	0.13	5.9
	B	0.13	5.9
BP ₂ (DS2+ES2+CT2+bustbar)	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
BP ₂ (DS9+ES9+FES9+bustbar)	R	0.735	33
	Y	0.735	33
	B	0.735	33
BP ₃ (bustbar)	R	2.016	90.5
	Y	2.693	120.9
	B	3.369	151.3
Total		17.47	793.3

BAY418			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₁ (CB)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (busbar)	R	1.18	53.2
	Y	1.17	52.7
	B	1.18	53.2
BP ₂ (DS1+ES1+CT1)	R	0.13	5.9
	Y	0.13	5.9
	B	0.13	5.9
BP ₂ (DS2+ES2+CT2+busbar)	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
BP ₃ (DS9+ES9+FES8+busbar)	R	0.735	33
	Y	0.735	33
	B	0.735	33
BP ₅ (busbar)	R	2.821	126.7
	Y	2.678	120.4
	B	2.535	113.8
BP ₆ (busbar)	R	0.847	38.0
	Y	1.666	74.8
	B	2.486	111.6
Total		22.425	1015.9

BAY421			
GAS COMPONENT NO.		VOLUME(m ³)	GAS WEIGHT(kg)
BP ₁ (C8)	R	0.884	42.4
	Y	0.884	42.4
	B	0.884	42.4
BP ₁ (busbar)	R	1.18	53.2
	Y	1.17	52.7
	B	1.18	53.2
BP ₂ (DS1+ES1+CT1)	R	0.13	5.9
	Y	0.13	5.9
	B	0.13	5.9
BP ₃ (DS2+ES2+CT2+busbar)	R	0.205	9.2
	Y	0.205	9.2
	B	0.205	9.2
BP ₄ (DS9+ES9+FES8+busbar)	R	0.735	33
	Y	0.735	33
	B	0.735	33
BP ₁ (busbar)	R	2.179	97.8
	Y	2.035	91.4
	B	1.892	85.0
BP ₁ (busbar)	R	2.298	103.2
	Y	2.298	103.2
	B	2.298	103.2
BP ₁ (busbar)	R	0.847	38.0
	Y	1.666	74.8
	B	2.486	111.6
Total		27.391	1238.8

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CA NO.		01/PV/UNL-CS-9585-001-2/ND-A-FC DATED 08/03/2018 01/PV/UNL-CS-9585-001-2/ND-A-SC DATED 08/03/2018 01/PV/UNL-CS-9585-001-2/ND-A-FC DATED 08/03/2018			
ADDITIONAL INFORMATION W.O.No.		आहूक/परियोजना का नाम PATRATRU VIDYUT UTPADAN NIGAM LTD. PATRATRU SUPER THERMAL POWER			
STATUS OF DRAWING		NAME OF CUSTOMER/PROJECT PROJECT EXPANSION PHASE-I (3x800 MW)			
DISTRIBUTION OF PRINTS		 भारत हेवी इलेक्ट्रिकल्स लिमिटेड भारतीयाण परियोजना विभाग BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION			
REV.		DATE	ALTERED CHECKED	HG FAN YQ DONG	मिशन DEPT.
1		16/03/2019	APPROVED	YZ CAO	कोड CODE
ZONE		 अनुपात / SCALE		कार्ड कोड CARD CODE	VENDOR Sieyuan Electric Co., Ltd.
Revise the drawing as the comments dated on 07022019		ड्राईंग.क./DRAWING NO. NTPC DRG NO. 9585-001-572-PVE-B-0290 BHEL DRG NO. TB-397-316-GIS-001			पुनः/REV. 02
शीटक./TITLE GAS SYSTEM DIAGRAM 400kV GIS SINGLE LINE DIAGRAM		पृष्ठ क./SHEET No. 03 आगामी पृष्ठ/NEXT SHEET			