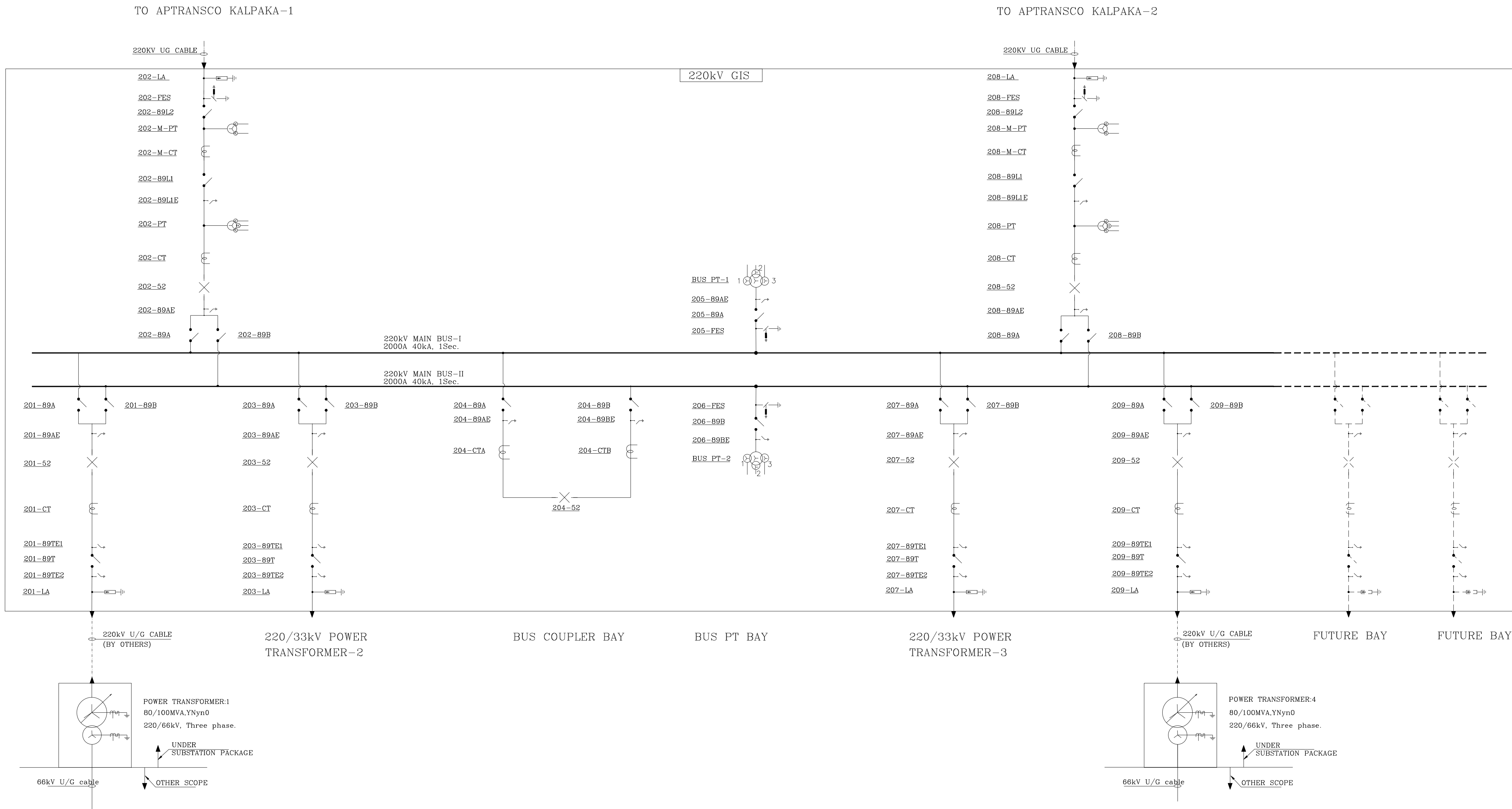


Annexure-2: 220KV GIS SLD



| TECHNICAL PARAMETERS |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S/L NO.              | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 01                   | <p><b>POWER TRANSFORMER:</b><br/> 220/66 kV, 3 PHASE, 100/80MVA (ONAN/ ONAF). OLTC RANGE IN STEPS OF 1.25%, ±10%, <math>\pm 12.5\%</math>.<br/> BUSHING HV-NC – 2000/3000/4A, CL-PS.<br/> BUSHING LV-NC – 1000–800/1A, CL-PS</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 02                   | <p><b>GIS BUS BARS MODULE:</b><br/> 245 kV, 2000 A, 40 kA for 1 sec. Single/Three Phase (isolated) encapsulated UNIT, SF6 Gas Insulated, Metal enclosed Bus Bars. Bus Enclosures running along the length of the Switchgear to interconnect each of the Circuit Breaker Bay Module in Double Bus System. Each Phase shall be complete with Inductive Voltage Transformers (VTS) Gas Insulated. Isolator/ Disconnectors, Earth Switches and High speed earth Switch complete with Manual and Motor Driven Operating Mechanisms, GIS Duct with SF6 Gas Monitoring System and Accessories etc complete in all respects.</p>                                                                                |
| 03                   | <p><b>GIS COUPLER BAY MODULE:</b><br/> 245 kV, 2000 A, 40 kA for 1 sec. 1-phase SF6 Gas Insulated Bus Coupler Bay Module comprising of SF6 Gas Insulated Circuit Breaker (2000 A), Current Transformers (2000–1000/1A), Bus Bar Isolator / Disconnecter Switches (2000 A) combined with Safety Grounding Switches complete with one Manual and Motor Driven Operating Mechanism, Local Control Cubicle/ LCCO GIS Duct with SF6 Gas Monitoring System and Accessories etc complete in all respects.</p>                                                                                                                                                                                                  |
| 04                   | <p><b>TRANSFORMER BAY MODULE:</b><br/> 245 kV, 1600 A, 40 kA for 1 sec. 1-phase SF6 Gas Insulated Transformer Circuit Breaker Bay Module comprising of SF6 Gas Insulated Circuit Breaker (1600 A), Current Transformers (1200–600–300/1A), Isolator / Disconnecter Switches (1600 A) combined with Safety Earth Switch complete with Manual and Motor Driven Operating Mechanisms, Local Control Cubicle (LCCO) SF6 Gas Monitoring System for complete Bay, Surge arrester, 220kV power cable and Gas Insulated Terminal Connection for connecting 80/100MVA, three Phase 220/66kV, Power Transformers with 220 kV GIS through 1/2C cable terminating and Accessories complete in all respects.</p>     |
| 05                   | <p><b>TRANSMISSION LINE FEEDER BAY MODULE (UG Cable):</b><br/> 245 kV, 1600 A, 40 kA for 1 sec. 1-phase SF6 Gas Insulated Transmission Line Feeder Bay Module each comprising of SF6 Gas Insulated Circuit Breaker (1600 A), Current Transformers (1200/600/300/1A), Isolator / Disconnectors (1600 A) Switches with combined Earth Switch complete with Manual and Motor Driven Operating Mechanisms,surge arrester, High Speed earth Switch complete with group operated manual and Motor Driven Operating Mechanism,PT,Metering CT,Metering VT, SF6 Gas Monitoring System and Accessories complete in all respects. 220kV cable plugin termination and accessories etc complete in all respects.</p> |

| SYSTEM PARAMETERS |                                                                 |                      |
|-------------------|-----------------------------------------------------------------|----------------------|
| SL.NO             | DESCRIPTION OF PARAMETERS                                       | 220kV SYSTEM         |
| 01                | NOMINAL SYSTEM VOLTAGE                                          | 220kV                |
| 02                | ONE MINUTE POWER FREQUENCY DRY & WET WITHSTAND VOLTAGE (kV rms) | 450kV                |
| 03                | BASIC INSULATION LEVEL                                          | 1050kVp              |
| 04                | SYSTEM FAULT LEVEL                                              | 40kA for 1Sec.       |
| 05                | SYSTEM NEUTRAL EARTHING                                         | Effectively Earthed. |
| 06                | SYSTEM FREQUENCY                                                | 50Hz                 |
| 07                | AMBIENT TEMPERATURE                                             | 50 deg. C.           |
| 08                | CREEPAGE DISTANCE                                               | 31mm / kV            |
| 09                | BUS CONFIGURATION                                               | DOUBLE MANN          |

|                                                                                                                                    |                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| EQUIPMENT NUMBERING SYSTEM                                                                                                         |                                                                                              |
| <div style="border: 1px solid black; padding: 10px; margin: 10px;"> V   BN   -   EN   -   C </div>                                 | <p>CONNECTED EQUIPMENT</p> <p>ANSI NO. FOR EQUIPMENT</p> <p>BY NO.</p> <p>SYSTEM VOLTAGE</p> |
| SYSTEM VOLTAGE (V):                                                                                                                | BAY NO. (BN):                                                                                |
| 2   -   22KV                                                                                                                       | FROM 01 TO 09                                                                                |
| EQUIPMENT NO. (EN):                                                                                                                | CONNECTED EQUIPMENT (C):                                                                     |
| BT - ISOLATOR                                                                                                                      | CONNECTED TO MARK BUS-1                                                                      |
| 52 - CIRCUIT BREAKER                                                                                                               | CONNECTED TO MARK BUS-2                                                                      |
|                                                                                                                                    | CONNECTED TO TRANSFORMER                                                                     |
|                                                                                                                                    | CONNECTED TO LINE                                                                            |
| <p><b>LEGEND:</b></p> <p>_____ - PRESENT SCOPE</p> <p>_____ - 22KV W/ CABLE</p> <p>_____ - 52KV DUCT</p> <p>_____ - FUTURE BAY</p> |                                                                                              |

|                      |       |                                                                |          |      |            |           |
|----------------------|-------|----------------------------------------------------------------|----------|------|------------|-----------|
| PRINCIPLE CONSULTANT |       | PTC INDIA LIMITED                                              |          |      |            |           |
| TITLE                |       | 220/66kV GIS SUBSTATION AT HPCL, VIZAG.<br>SINGLE LINE DIAGRAM |          |      |            |           |
| CLIENT               |       | HPCL LTD. VISAKHAPATNAM                                        |          |      |            |           |
|                      | SIGN  | DATE                                                           | REVISION | DATE | DRG.NO.    | SIGNATURE |
| DRN.BY-              | S.S   |                                                                |          |      | HPCL.PK2.1 |           |
| CHN.BY-              | L.S   |                                                                |          |      |            |           |
| APP.BY-              | R.K.M |                                                                |          |      |            |           |

FOR TENDER PURPOSE ONLY