

Annexure – Mandatory Spares

Sl. No	Mandatory Spares and Maintenance equipment	Quantity (Vizag Pole-1)
1	Spares for Control & Protection	As per Annexure-C&P (In case quantity arrives in fraction then it shall be rounded up)
2	Complete DC Current transformer along with all accessories including electronics (main equipment)	1 no. of each type and rating.
5	DC Voltage Divider accessories & electronics (Electronic & accessories of main equipment)	1 set of each type and function
6	CVT / CVD (If supplied separately) with terminal connectors and stool structure.	1 No for population upto 10. 2 Nos for population more than 10 .
7	Valve Cooling Equipment	As per Annex-VC
8	PLC Filter Equipment Capacitor units for each type, fitments hardware & accessories of each type of capacitor. Reactor unit of each type, Fitments, hardware & accessories. Applicable Tuning Unit if any	2% of population or minimum 02 nos. 1 Set 1 Set
9	Prefabricated cables / patch cords / factory fitted cables with end terminations for control, protection, data acquisition, communication, fault recording, diagnostic, annunciation, alarm and monitoring (except telecommunication).	Patch cords – 2 nos. Others - Minimum 10% of each type and length. In case quantity arrives in fraction then it shall be rounded up.
10	Battery charger spare	One number of all type of cards, 1 set of thyristor/IGBT/Diode (each type and rating), DC/DC Supply one set, One number of all type of contactors/MCBs. Fuses of thyristor with indicators – 6 sets.
	Batteries - 220V and 48V	Spare battery cells (each type) – 5 Nos. Terminal connectors with bolts and nuts – Nos (each type).
11	UPS Spare (For SCADA and Valve Cooling UPS/UMD)	As per Annexure_UPS
13	Thyristor Valve	
i.	Complete Thyristor module	1set
ii.	Thyristors of each type and rating	2% of total population

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iii.	Surge arrestor(VH) of each type and rating	2 Sets
iv.	Valve reactor module of each type and rating	2 nos.
v.	Snubber capacitors of each type	2%of total population.(max to 50 nos)
vi.	Snubber resistors of each type	2%of total population(max to 50 nos)
vii.	Grading capacitors of each type	2%of total population
viii.	Thyristor electronics (PCBs) of each type, Gatecards/TCU/TE as applicable	2%of total population
ix.	Fiber optics with end termination for each function	1set (with longest FO length) for single tower
x.	Insulators of each type with fitments, hardware & accessories	2 Nos
xi.	Corona Shield of each type with fitments, hardware & accessories	1 No
xii.	Fitment hardware & accessories for 1module	1 set
xiii.	Cooling tubes with coupling-each type	5% of Population or 2 sets, which ever is higher
xiv.	Clamps and connectors of each type	2 Sets
xv.	Not used	
xvi.	Spare parts for Valve based electronics	10% of total population or minimum 2no's
xvii.	Assembly accessories for surge arrestors of each type and rating	1 set
xviii.	Arrestor counter of each type	2 Nos
xix.	Set of tools to change Thyristors with all fitments and accessories	2 Sets
xx	Hardware, connectors, and fittings Suitable for one complete single tower	1 set

Annexure – C&P

Sl. No	Particulars	Quantity (Vizag Pole-1)
1	Set of Modules/Cards, Main Protective Relay/Auxiliary relay & contactors of each type and function required for Control, Protection, Communication, Annunciation, Alarm, Scada & Monitoring (Including modules for Mini simulator/valve test equipment/valve control test equipment /RCI etc) for AC/DC systems	20% of Population or minimum 02 Nos
3	Spares for Workstation/HMI/Server hardware along with software	1 set
6	Cards/module for Transient Fault Recorder/ Disturbance Recorder including software (Wherever applicable)	1 set
7	LAN Switch each type	2 No
8	GPS Time display unit receiver card & antenna	1 Set
9	Printer of each type along with cartridges	1 set
10	DAT//Storage device/recording system for Work Station	6 Nos.
	Monitor- each type	1 No
11	Thermostat	02 nos
12	Panel space heater	02 nos
13	Computers (MACH/ eLumina /Simatic TDC) along with Modules/Cards	1 set
14	HMI units	02 nos

Annexure_VC

1	<u>Valve cooling Equipment</u>	<u>Quantity</u>
1.1	Raw water pump & Motor	1 No.
1.2	Fine water pump & Motor	2 No.s
1.3	De-ionising resin for one complete replacement	1 Set per Block
1.4	Non-return Valve-each type & size	1 Set
1.5	Make up pump & motor	1 Set
1.6	Fine filter with fitment, hardware and accessories	2 Sets
1.7	Coarse filter with fitment, hardware and accessories	2 Sets
1.8	De-oxynising resin for one complete replacement	1 Set
1.9	Cooling fan with drive motor, fittings and accessories	10% of population or 5 Nos, whichever is higher
1.10	Biodides	1 lot
1.11	Control Modules for each type and function of Valve cooling system	1 Set
1.12	Set of valve hall ventilation control devices and modules	1 Set
1.13	Motor operated Valve of each type	1 No
1.14	Pump shaft seal of each type of pump	2 Sets
1.15	Rings & Gaskets of each type	2 Sets
1.16	Contactors/ starters, relays, timers, solenoids, fuses, switches, MCBs of each type & rating	10% of population
1.17	PLC loaded with program along with configuration software	1 Set
1.18	Flow meter/ sensor of each type	2 Sets
1.19	Pressure gauge of each type	2 Sets
1.20	Temperature sensors of each type	2 Sets
1.21	Conductivity sensors	2 Sets
1.22	Indicating instruments of each type	2 Sets
1.23	Valve of each type and size	2 Sets
1.24	Couplings of various sizes & types	2 Sets
1.25	Clamps and fixing material	2 Sets
1.26	Heat exchanger fan with motor	1 Set
1.27	Chemical Dosing System pump assembly	1 No.
1.28	Pressure transducer of each type	2 Sets
1.29	Solenoid valves of each size & type	2 No.s
1.30	Float valve assembly of each type	2 No.s
1.31	Spray nozzles, Grommets & other mechanical spares	10 % of population
1.32	Level Switches & Level transducer of each type	2 Nos.
1.33	Gas pressure regulators of each type	2 No.s
1.34	Control Transformer of each type	2 No.s
1.35	Air Pump of each type	1 No.
1.36	Trip amplifier of each type	1 No.

1.37	Set of spares for Cooling Tower	1 Set
1.38	Power Supply Moule	2 No.s
1.39	Heaters	1 No.

Note: Scope of supply of spares will be decided at the time of detailed engineering in line with the supply of main valve cooling equipment and applicability thereof.