ANNEXURE 1: TECHNICAL SPECIFICATION OF SAFETY RELIEF VALVES

Quantity	:	As given in Table 1
Tag number	:	As given in Table 1
Type	:	As given in Table 1
Extent of lift	:	Full lift
Fluid medium	:	As given in Table 1
Set pressure	:	As given in Table 1
Working temperature range	:	250-350 K
Flow temperature	:	300 K
Minimum required flow capacity	:	As given in Table 1
Orifice designation (area)	:	To be specified by the bidder in the quotation
Over-pressure	:	≤ 10 % of set pressure
Blow-down	:	7 to 10 % of set pressure
Permissible leakage rate across seat	:	As per API 527
End connection	:	As per Table- 1
Material of construction:		
Body, bonnet	:	ASTM A 351 CF 8/ 8M (or) ASTM A 182 F 304/316/321
Nozzle, seat, guide	:	ASTM A 479 304/ 316/ 321
Seat	:	ASTM A 182 F 304/316/321
Bellows	:	Stainless steel 316L/ 316Ti/ 321/ Hastealloy C 276/

		Inconel 600/ 625/
Spring	:	Stainless steel 316
Bolts	:	ASTM A 320 Gr B 8
Nuts	:	ASTM A 194 Gr 8
Design code	:	API 526/ API 520/ ASME Section VIII, Division 1

Tests:

a. Material certificates: The material certificates, detailing the physical and chemical properties, of the principal pressure–bearing parts shall be provided.

b. Soundness test for castings (wherever applicable): All the castings shall be subject to soundness test with radiographic or ultrasonic technique for flaw detection.

c. Seat leakage test: As per API 527

d. Cold differential set pressure test: To validate set pressure and resealing pressure.

e. Prototype flow capacity test: Copy of the prototype test certificate by accredited agency for the flow capacity of the valve shall be produced.

f. Hydro test: Nozzle shall be hydro tested with water at minimum 1.5 times the set pressure.

g. Shell pneumatic test: The shell of the assembled valve shall be subject to pneumatic test at 0.69 MPa (g) by pressurizing through the outlet end connection with dry Air of Nitrogen.

Cleanliness

All the interior flow surfaces of the valve shall be degreased and cleaned to Oxygen service standards as per CGA G-4.1 or ASTM G 93.

Marking

All the valves are assigned tag numbers for the sake of identification. The tag number for each valve, as indicated above, besides set pressure, size & pressure rating class of inlet & outlet connections, material of construction, etc, shall be legibly and indelibly engraved on the body of the valves.

SPARES:

One Spare kid for each Sl No. shall be supplied

Quality assurance plan: As given in Table 2.

ANNEXURE 2
SPECIAL CONDITIONS

1) Guarantee/Warranty: The products shall be guaranteed/ warranted for satisfactory performance over a period of 18 months from the date of dispatch from the vendor's factory or 12 months from the date of commissioning at the purchaser's site, whichever is earlier.

2) Inspection: The Inspection of the products shall be carried out by the Third Party Inspection (TPI) agency. The scope of inspection shall be as per the Technical specification and Quality Assurance Plan (QAP) given in Table 2. TPI agency, shall be chosen from the following list only:

    a. Lloyds Register Industrial Services Pvt Ltd (LRIS)
    b. Bureau Veritas Industrial Services Pvt Ltd (BVIS)
    c. Det Norske Veritas (DNV)
    d. Technischer Uberwachungs Verein (TUV)
    e. Bax Counsel Inspection Bureau Pvt Ltd

    It shall be the responsibility of the vendor to arrange for and coordinate with the TPI agency. Name of the TPI agency shall be indicated in the quotation. **All the valves shall be hard stamped by TPI.**

3) Environmental Conditions: The products shall be designed for outdoor installation as per the following environmental conditions:

    a. Dry-bulb temperature: 288 K (15°C), minimum
       323 K (50°C), maximum in shade
    b. Relative humidity: 25 to 100 %
    c. Wind speed: 0 to 60 m/s (216 km/h)
    d. Rainfall: Tropical

4) Along with the Quotation: Following documents shall be provided:
    i) A complete technical description, along with drawings, catalogues and orifice size of the valves along with sizing calculations.
    ii) Price details such as basic product price, testing charges, spares prices, packaging and forwarding charges, Freight etc.
    iii) Deviations, if any, from the tender enquiry specification shall be explicitly spelt out.

5) Documentation: The following documents (2 copies, in English) shall be provided by the Supplier at the different stages specified thereupon:

a) Within 1 week from placement of the purchase order, following documents shall be provided. These documents are subjected to review by the Purchaser. Only upon receipt of the Purchaser's approval of these documents, the vendor shall proceed with manufacture of the products. However, the Purchaser's approval shall not absolve the vendor of their responsibility to comply with the specification of the purchase order.

   i) A General Arrangement (GA) drawing, indicating the overall dimensions of the product along with the accessories & sizing calculation of Rupture Disc Devices.

   ii) A detailed cross sectional/ fabrication drawing of the product, indicating the dimensions and Material of Construction (MOC) of each part.

b) Upon satisfactory inspection of the products, following documents shall be provided. The purchaser shall review these documents for compliance with the specification of the purchase order and issue "purchaser's delivery clearance". Only upon receipt of the same, the vendor shall proceed with delivery of the products.

   i) Certificates of tests specified in technical specification duly authorized by the inspector.

   ii) Inspection report by the inspector.

c) Along with the consignment, following documents shall be provided:

   i) Instruction manual for installation, operation, maintenance and trouble-shooting.

   ii) Guarantee certificate.

6) The items are to be supplied within 4 months of the date of purchase order. However, the vendor shall provide best possible delivery period along with quotation.

7) Pre Qualification Criteria

i) The vendor shall have minimum five years experience in manufacturing SRV. The vendor shall enclose at least two purchase orders placed with Central / PSU/State Government organizations. Evidence for order execution in terms of Third party inspection release note or acceptance note from the client shall be provided.

ii) The valve model shall be ASME certification i.e Valves shall be UV certified to ensure the certified capacity and functional characteristics of ordered valves as per ASME code. Parties shall produce UV certification along with the offer.

The offer will not be considered if the above 2 criteria's are not complied.

S No	Quantity Nos.	Tag number	Fluid medium	Set pressure, MPa (g)	Inlet flange size& rating	Outlet flange size& rating	Minimum required flow capacity(g/s)	Type
1	3	RVR 516, CVR 516,Spare-1	GH2	22	To be specified by the bidder	To be specified by the bidder	176	Balanced bellow
2	3	RVR 712, CVR 712,Spare-1	GN2	22	To be specified by the bidder	To be specified by the bidder	677	Conventional
3	2	RVR 517,Spare-1	GCH4	18	To be specified by the bidder	To be specified by the bidder	1030	Balanced bellow
4	6	RVR 718, RVR 714, RVR 714S, CVR 718, CVR 714 Spare-1	GN2	22	To be specified by the bidder	To be specified by the bidder	37	Conventional
5	2	CVR M 514,Spare-1	GCH4	22	To be specified by the bidder	To be specified by the bidder	33	Balanced bellow
6	3	RVR 412, CVR 412,Spare-1	GO2	18	To be specified by the bidder	To be specified by the bidder	434	Conventional

GH2: Gaseous Hydrogen GN2: Gaseous Nitrogen GCH4: Gaseous Methane
GO2: Gaseous Oxygen

Table 2: QUALITY ASSURANCE PLAN FOR SAFETY RELIEF VALVES

S No	Test	Object tested	Characteristic sought for	Sample size	Test procedure	Acceptance criterion	Form of record	Pre-Delivery Inspection (PDI)		
								Test performed by	Test witnessed by	Record reviewed by
1.	Material test	Specimen from raw materials	Chemical composition and physical properties	1 per lot	Relevant standard	Relevant material specification	Material certificate	Vendor or Third party laboratory	-	Vendor, Inspector, Purchaser
2.	Soundness test for castings	Castings	Absence of defects	100 %	Radiographic or ultrasonic test	Relevant standard	Test certificate	Vendor	-	Inspector, Purchaser
3.	Dimensional check	Valve	Dimensions	100 %	Metrology	Relevant standard/ Purchaser-approved drg.	Test report	Vendor	-	Inspector, Purchaser
4.	Seat leakage test	Valve	Leakage rate across seat	100 %	API 527	API 527	Test certificate	Vendor	Inspector	Purchaser
5.	Cold differential set pressure test	Valve	Set pressure, resealing pressure	100 %	ASME, Section VIII, Division 1	ASME, Section VIII, Division 1	Test certificate	Vendor	Inspector	Purchaser
6.	Flow capacity test	Valve	Flow capacity	Prototype	ASME, Section VIII, Division 1	ASME, Section VIII, Division 1	Certificate	Vendor/ Principal	-	Inspector, Purchaser
7.	Cleanliness	Valve	Cleanliness for Oxygen service	100 %	CGA G-4.1/ ASTM G 93	CGA G-4.1/ ASTM G 93	Certificate	Vendor	-	Inspector, Purchaser

Notes: 1. Inspector: Third party inspection agency

2. The Purchaser shall perform the Material Receipt Inspection (MRI).