SECTION-III (Part-A)

TECHNICAL SPECIFICATION FOR 12 KV OUTDOOR VACUUM CIRCUIT BREAKER KIOSKS AGAINST TN-2379.

1.0 SCOPE

This specification is intended to cover the design manufacture, assembly, testing at manufacturer's works, supply, delivery of 12 kV Vacuum Circuit breaker Kiosks with current transformers, Potential transformers, protection relays, metering instruments etc. Complete with all accessories and Installation & Commissioning by the supplier as per Schedule-III (Part-B) for efficient & trouble free operation (Separate price for Installation & Commissioning and Civil works).

1.1 It is not the intent to specify completely herein all details of the design and construction of equipments. However, the equipment shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation upto the Bidder's guarantee in a manner acceptable to the Purchaser, who will interpret the meanings of drawings and specifications and shall have the power to reject any work or material which in his judgment is not in accordance therewith. The offered equipment shall be complete with all components necessary for its effective and trouble free operation along with associated equipments, interlocks, protection schemes etc. Such components shall be deemed to be within the scope of supply, irrespective of whether those are specially brought out in this specification and/or the commercial order or not.

2.0 STANDARDS

The 12 KV vacuum circuit breaker Kiosks shall conform to latest revisions with amendments of standards as under unless specified otherwise. Equipment meeting any other authoritative standard which ensure equal or better quality than the standard mentioned above will also be acceptable. In such cases a copy of standard (English version) adopted, should be enclosed with the tender.

IEC62271/100-200	High Voltage Switchgear & Control gears.
IS:13118/IS-3427	Circuit Breaker/ metal enclosed Switchgear and control gear.
IS: 3156	Voltage transformers.
IS: 2705	Current transformers.
IS: 3231	Electrical Relays for power system.
IS:1248	Meters and Instruments
IS:14697-1999	Specification for AC static transformer operated watt hour and VAR hour meters class 0.2 S & 0.5 S.

IEC-62053-22-2003 IEC-62052-11-2003	Specification for AC Static Watt hour Meters, class 0.2 S & 0.5 S.
CBIP Technical Report No.88 revised July, 1996 read with amendment issued (April,99, September,99 and also any other amendment thereafter).	Specification for AC Static Electrical Energy Meter.

3.0 CLIMATIC CONDITIONS:

Equipment to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions :-

i) Peak ambient air temperature in shade.	50 DEG C
ii) Minimum ambient air temperature in shade	(-) 5 DEG C
iii) Maximum relative humidity.	95 %
iv) Minimun relative humidity	10 %
v) Dust storms are liable to occur from the period	March to July
vi) Height above mean sea level	less than 1000M
vii) Average number of thunder storms days per annum.	40 DAYS
viii) Average annual rainfall	10-100 cm (Depending on area)
ix) Number of months of tropical monsoon conditions p.a.	4

4.0 PRINCIPAL PARAMETERS OF CIRCUIT BREAKERS

4.1 TYPE AND RATING	12 kV
4.1.1 Type	Vacuum circuit breaker
4.1.2 Service	Outdoor
4.1.3 Pole	3
4.1.4 Rated voltage (nominal/max.)	11/12 kV
4.1.5 Rated frequency	50 HZ

4.1.6 System Neutral earthing	Effectively grounded.
4.1.7 INSULTATION LEVEL	
4.1.7.1 Impulse withstand	75 kVp
4.1.7.2 One minute power frequency withstand voltage.	As per relevant standards.
4.1.8 Rated Current	
4.1.8.1 Continuous at 50 °C.	630 A
4.1.8.2 Short time current for 3 Sec.	16 kA
4.1.9 Rated Breaking Capacity	
4.1.9.1 Symmeterical	16 kA
4.1.9.2 Asymmeterical	As per relevant standard
4.1.10 Rated making capacity	2.50X16 KA
4.1.11 Rated short time with-stand current 3 secs.	16 KA
4.1.12 Total break time Closing time	3 cycles(Max.) 4 cycles (Max.)
4.1.13 Creepage distance	300 mm or more
4.1.14 Protection class of kiosk	IP-55 as per IEC 529
4.1.15 Operating duty For gang operation	O-0.3 Sec-CO-3min-CO
4.1.16 Operating Mechanism	motor operated spring charged closing mechanism or Magnetic Actuator.
4.1.17 Spring charging Motor	220V-240V
4.1.17.1 Heater/Lamp/Socket.	240V AC
4.1.18 Terminal Connector	
4.1.18.1 Type	Bimetallic clamp type/ Al. alloy.

4.1.18.2	Suitable for ACSR conductor	10% Panther and 90% Dog Conductor
4.2	System details	
4.2.1	H.V. System Voltage (Nominal/Max.)	11/12 kV
	Phases	3
	System Neutral	Effectively earthed.
	Fault level	16 KA r.m.s. Symmetrical
4.2.2	Auxiliary power Supply	
4.2.2.1	A.C. Supply	1. 415 volts 3 ph 4 W 50 Hz 2. 240V 1 Ph 2 W 50 Hz

5. **GENERAL TECHNICAL REQUIREMENTS:-**

5.1 DESIGN CRITERIA

The bidder shall quote 12 KV Outdoor VCB Kiosks conforming to M-2 class only. The equipment will be used in high voltage system having characteristics as listed in the specification. The equipment will be installed outdoor in a hot, humid and tropical atmosphere. All equipment, accessories and wiring shall have tropical protection, involving special treatment of metal and insulation against fungus, insects and corrosion.

The maximum temperature in any part of the equipment at specified rating shall not exceed the permissible limits as stipulated in the relevant standards.

The equipment shall be capable of withstanding the dynamic and thermal stresses of listed short circuit current without any damage or deterioration.

The safety clearances of all live parts of the equipment shall be as per relevant standards.

The cowling provision shall be provided on the roof of 12 KV outdoor VCB Kiosk to avoid direct inception of water at any joint.

5.2 SPECIFIC REQUIREMENTS

5.2.1 The vacuum circuit breaker kiosk shall be for outdoor installation. The duty of the circuit breaker shall involve satisfactory interruption of short circuit currents as listed in the specification. The breaker shall be capable of interruption of low reactive current (lagging/leading) without undue over voltage.

5.2.2 CONSTRUCTIONAL FEATURE

5.2.2.1

a) The circuit breakers shall be triple pole horizontal fixed type enclosed in Kiosk of CRCA sheet steel of 3 mm thickness for load bearing members and 2 mm thickness for non-load bearing members and shall comply with latest edition of IS:13118/3427/IEC-56. The Kiosk shall be vermin proof and dust tight. The switchgears and Control gears shall be complete with all necessary supporting frame works, Nuts and bolts etc. for securing the same to the floor. The operating mechanism shall operate (close/open) all the three phases simultaneously. The operating mechanism links etc. should be accessible for maintenance. The circuit breakers and its operating mechanism shall be fully interlocked to prevent mal-operation. All the breakers shall be supplied with necessary clamps and connectors suitable for appropriate current ratings. Rigid type bimetallic/Al.alloy terminal connectors of 630 Amps. current rating form part of supply. Suitable arrangement of earthing the switchgears shall be provided. All the connecting bus bars shall be made of copper.
b) Hinges of door shall be concealed type to avoid rusting and obstructive opening of the door.
c) The quality of welding shall be good and there should not be any lumps and splatters on the panel.
d) All the connecting bus bar and current carrying parts shall be made of copper.
e) All the gasket shall be of chemically treated neoprene.
f) Hole & Pin locking (Check nut) arrangement should also be provided while fixing the vacuum interrupter at bottom side.

5.2.2.2 Switchgear (Vacuum Circuit breakers etc.)and control gear (CTs.,PTs, relays etc.)shall be mounted on the same Kiosk. Bus bars shall be air insulated with PVC insulation/sleeves on electrostatic powder coating. The bus bars should be of electrolytic copper with permissible limits of current density. Size of the bus bars and current density should be specified in the tender. The bus bars conductor shall conform to Indian standard 8084 and 3427 and shall be rated for 630 A,STC 16 KA for 3 sec.

5.2.2.3 All the meters, instruments, relays etc. shall be mounted on the switchgear kiosk. The outdoor circuit breakers Kiosk shall be suitable for AC shunt tripping arrangement.

5.2.2.4 The Kiosk shall have an arrangement for emergency shunt tripping from remote place in addition to arrangement for local emergency tripping(Mechanical). The kiosk shall also have a system to check the "Trip circuit healthy check" in all the three phases. Necessary trip and closing coils shall be provided for operation of the breakers.

5.2.2.5 All the six terminals shall be brought out through appropriate class bushings.

5.2.2.6 The arcing contacts shall be made of homogeneous special alloy so that surge voltage are reduced to negligible level & multiple reignition is eliminated.

5.2.2.7 The circuit breaker kiosk shall be electrically and mechanically trip free under various conditions.

5.2.2.8 The provision shall be kept on the kiosk roof and roof bushing assembly to adopt arcing horns.

5.2.2.9 The lifting arrangement shall not cause any effective loss of creepage distance/ phase to earth clearances as specified in the ISS/IEC.

5.2.3 MAIN CONTACTS

The main contacts shall have adequate area and contact pressure for carrying rated continuous and short time current without excessive heating liable to cause pitting and welding.

The breakers may be provided with silver plated contacts, if necessary, to meet the requirement of IS:13118/IEC56 where higher temperature rise is permitted with silver plated contacts. The quantity of silver facing shall be such that after carrying out one tenth of total number of operations specified for mechanical endurance tests, there is still continuous layer of silver on contacts.

5.2.4 NUMBER & TYPE OF SPARE, AUXILIARY CONTACTS/ SWITCHES :

Adequate number of spare auxiliary switches/contacts both of normally open & normally close type but not less than four each shall be provided on the circuit breaker for use in the indication and controlling scheme of circuit breakers.

5.2.5 INTERLOCK

All electrical and mechanical interlocks which are necessary for safe and satisfactory operation of the circuit breaker shall be provided .

5.2.6 BUSHINGS FOR CIRCUIT BRAKER KIOSK

a) The out door circuit breakers shall be metal enclosed fitted with weather proof/ suitable type bushing conforming to IS:2099 and shall be designed to have the necessary mechanical strength and rigidity required and shall be free from objectionable interference and external and internal corona. The porcelain shall be of the wet process type, homogeneous, free from laminations and cavities or other flaws which could effect its chemical & mechanical strength and shall not be injuriously stressed by temperature change. The porcelain shall be thoroughly vitrified tough and impervious to moisture and shall be evenly glazed. The glazing shall be free from blisters or burrs. The bushing shall be designed manufactured & tested in accordance with latest edition of IS:2099. The type and characteristic data bushing shall be clearly specified.

b) The bushing shall not be subjected to direct point loading. They shall be provided with neck around clamps for evenly distributed pressure.
c) The bushing shall be mounted using suitable clamps and gasket arrangement to provide required degree of protection.
d) The bushing assembly shall be provided with lock nut and check nut which will be non-magnetic and non-corrosive.

5.2.7 OPERATING MECHANISM

Characteristics of Operating mechanism of circuit breaker and associated equipments :

Method of operation: The circuit breaker shall be equipped with power operated mechanism to operate all three phases simultaneously using 220/240 V AC Motor operated spring closing mechanism or magnetic actuator type. It shall be electrically & mechanically trip free under various conditions. Kiosk shall also be provided with hand operated spring charging closing mechanism. Operation counter and mechanically ON-OFF indicator shall be provided.

5.2.8 VACUUM CIRCUIT BREAKER

The three phase vacuum circuit breaker will have three vacuum interrupters (one interrupter per phase) mounted on same carriage. The interrupters shall be air insulated with epoxy resin / insulated phase barriers. Each interrupter shall have fixed and moving contacts in sealed envelops having vacuum

below 10^{-6} torr. The metallic bellow shall permit axial movement of moving contact and act as vacuum seal. The contacts shall have requisite mechanical strength and good electrical and thermal conductivity and shall be made of copper chromium alloy. Complete literature of vacuum bottles shall be furnished with the tender.

In order to have safe operation under fetal conditions, the vacuum interrupter should be housed in epoxy pole unit and make of Vacuum Interrupter will be as "**BEL, CGL, SIEMENS, ABB, ALSTOM/AREVA, MEGAWIN, TOSHIBA**".

Any other equivalent make of V.I. shall also be acceptable subject to prior approval of S.E. (MM), JVVNL, Jaipur.

5.2.9 VOLTAGE TRANSFORMERS

i)	Highest equipment voltage	:	12 KV
ii)	No. of phases.	:	3 Nos. single phase VTs
iii)	Insulation level.		
	a) Impulse withstand voltage	:	75 KVP
	b) One minute power frequency withstand voltage on :		
	i) Primary winding	:	As per relevant standard.
	ii) Secondary winding	:	2 KV rms
iv)	Frequency.	:	50 Hz.
v)	Transformation ratio.	:	11000/110 V
vi)	Rated output.	:	100VA/Phase
vii)	Accuracy class.	:	0.5
viii)	Rated voltage factor.	:	1.2 continuous & 1.5 for 30 sec.
ix)	Type of insulation	:	Resin cast.

VTs, shall be provided with HRC type fuses on the secondary side. The VT fuses on primary side shall also be provided with all safety precautions. One of the secondary terminals of the VTs, shall be solidly earthed. Three numbers single phase voltage transformer of this rated output will be required for each circuit breaker kiosk. Voltage transformers shall be fixed type and shall be suitable for single phasing.

5.2.10 CURRENT TRANSFORMERS

i)	Rated voltage.	:	12 KV
ii)	Insulation level.		
	a) Impulse withstand voltage	:	75 KVP

	b) One minute power frequency withstand voltage on :		
	i) Primary winding	:	As per relevant standard.
	ii) Secondary winding	:	2 KV rms
iii)	Frequency.	:	50 Hz.
iv)	Rated continuous thermal current:		120% of rated primary current
v)	Short time thermal rating and its duration.	:	16 KA for 3 sec.

vi) Transformation ratio of CTs 400-200-100/5-5A	Core-I	Core.II
a) Rated output	15 VA	15 VA
b) Class of accuracy	5 P	0.5S
c) Accuracy limit factor.	15	-
d) Purpose	Relaying	Metering

vii)	Max.instrument security factor.	: -	5

12 KV current transformers shall be single phase. The core shall be of grade non ageing laminated silicon steel of low hysteresis loss and high permeability to ensure high accuracy at both normal and fault current.

5.2.11 The rating of secondary winding shall be 5 Amps. Required transformers ratio can be achieved in any manner, However, the current transformers will have to satisfy the requirement of rated VA burden, Class of accuracy , accuracy limit factor and short time thermal rating as have been specified above at all transformation ratio.

The rating of current transformers of all classes regarding ratio error, knee point voltage, resistance of secondary winding etc. shall have to be co-ordinate with the requirement of protective relays and protection scheme without any extra cost.

5.2.12 The tenderer shall also furnish along with the tender, complete general arrangement, schematic and outline diagrams indicating the mounting arrangement and position of current transformers, potential transformer, terminal block etc. Type of current transformers and potential transformers employed shall also be clearly stated.

5.2.13 INDICATING AND INTERGRATING METERS/INSTRUMENTS:

All indicating instruments shall be of switch board type, back connected suitable for flush mounting and provided with dust and vermin proof cases for tropical use and finished in suitable colour. All instruments shall have practical laboratory

means of adjustment of accuracy. The limits of errors for ammeters/voltmeter shall be permissible for class 1.5 instruments as per IS:1248. The ammeters and voltmeters shall be suitable scaled to indicate the current for all the ratings of current/voltage transformers. A phase selector switch with four/six positions shall be used to measure the current/voltage of each phase. The meter shall be located at eye level to facilitate observation of readings correctly.

Any alarm scheme shall have both audio-visual annunciations in redundancy of each other and appropriate accept and reset push buttons shall be part of alarm scheme.

5.2.14 RELAYS :

The circuit breaker shall be fitted with numerical relay having shunt trip coil for operation on 3 over current & one earth fault element. The numerical relay to be provided with the 12 KV Outdoor VCB Kiosk, should be so designed so as to operate/ trip on earth fault as well as on over current faults but should not operate on unbalance load conditions during single phasing (which can be achieved through residual voltage control or otherwise).

The circuit breaker shall have suitable arrangement for power supply of relay and breaker operation through shunt trip coil using power pack. The power pack should be suitable for 6 Nos. closing/ tripping operations and for future remote communication as well as breaker testing during long time power failure. The output voltage may be as per manufacturer's design. The charging of Power pack shall be through 230 V A.C. supply available at Sub-Station.

The make, model No., type and Technical specification of the relay as well as power pack are required to be mentioned in the bid.

The Relay & Power Pack arrangement system should be warranted for 5 years (in line with warranty of breaker).

The numerical relays shall have following features:-

a. Self Diagnosis

b. Minimum last five abnormal events recording (over current & earth fault) including fault level and phase along with date & time.

c. On-line display of current.

d. Communicable with open Protocol having RS-485 port.

e. The relay should contain four shots, three phase, programmable & auto reclose control feature.

The relay shall be numerical type mounted in flush pattern on the panel board. The relay should be rated for 110V AC as well as DC & 5 Amper CT secondary. The relay should conform to latest IEC specifications. The tenders shall furnish the detail in this regard along with the offer.

Relay TTB shall have trip bypass arrangement.

All the relays shall be provided with test blocks in panel so designed that the relays may be tested at site.The relays should have provision of testing either through test block or test plug easily accessible by injecting the voltage / current/frequency (as applicable) from external testing instruments /source without first disconnecting/ re-energizing the primary electrical circuit protected by the relays. Facilities for isolating the tripping circuit during such testing shall also be provided.

The requirement of test block shall not be applicable in case of drawout type relays which can be tested by using test plug without removing the relay from its casing.

The testing facilities provided in the relays shall be specifically stated in the bid. Necessary test plug etc. as may be required for proper testing shall be included in the contractor's scope of supply. One test plug with five panels or part thereof are to be supplied.

The technical suitability of relays/schemes may also be examined by Protection Wing of Discoms & acceptability will be judged appropriately.

The bidder must furnish type test reports as per relevant ISS/ IEC along with bid to suit the environmental conditions of our State, in respect of the relay (of the type and design offered) which should have been type tested in NABL accredited test laboratory in respect of such tests for which the lab has been accredited (for Indian make Relays)/ CPRI/ Nationally accredited testing laboratory (for Foreign make Relays).These type test reports should not be older than **Five years** from the date of opening of bid.

The Following makes of Relays are acceptable:-

a. Areva.
b. ABB.
c. Easun Reyrolle
d. C&S

e. JVS
f. SEL
g. ASHIDA
h. MEGAWIN
i. STELMEC
j. CGL

Any other equivalent make of relays shall also be acceptable subject to prior approval of S.E. (MM), JVVNL, Jaipur.

5.2.15 WIRING :

All wiring shall be of switch board type consisting of copper conductor of 2.5 sq.mm cross section insulated with polyvinyl chloride insulation suitable for 660V service and in accordance with relevant IS:732. Polyvinyl chloride used shall have excellent resistance against burning, moisture, oil and vermin and shall be finished with clear colour. Rubber insulated wiring shall not be acceptable. Tenderers shall furnish the details of method being adopted by them for joint/ connections.

All instruments and panel wiring shall be of heat resisting and self extinguishing type in compliance with British Standard Practice/IS. Plastic or porcelain cleats of the limited compression type shall be used for holding wiring runs. All wires shall be suitable for bending to meet the terminal studs at right angles. Metal cases of all apparatus mounted on kiosk shall be separately earthed by means of copper wire or strips. The following colour schemes of the wiring shall be used as per IS:375.

a) AC three phase circuits :

i) No.1 phase : Red
No.2 phase : Yellow
No.3 phase : Blue

ii) Neutral conductor : Black

iii) Connection to earth : Green

5.2.16 TERMINAL BLOCKS :

Terminal blocks shall be 650 V grade, box clamp type ELMEX 10 sq.mm or approved equal. Not more than two wires shall be connected to any terminal.

Spare terminals equal in number to 20% of active terminals shall be furnished.

Terminal blocks shall be located to allow easy access. Wiring shall be so arranged that individual wires of an external cable can be connected to consecutive terminals.

5.2.17 TEST TERMINAL BLOCK :

Two Nos. test terminal blocks shall be provided one for testing of relays and other for testing meters. They shall be of switch board type back connected for front of panel mounting. The test blocks shall provide complete isolation of meters, instruments etc. and the arrangement shall be such that testing power could be connected at the test block from any external source or may be taken from the instrument transformers. Provision shall be made for short circuiting current transformers. Suitable sealing arrangement shall be provided in test terminal blocks.

5.2.18 INDICATING LAMPS :

Indicating lamps shall be provided on the control board to indicate the following:

i) Visual indication of ON and OFF position of each circuit breaker.
ii) PT supply indication.

Each lamp body shall be of moulded insulation and shall be able to withstand a high voltage test of appropriate value. All lamps shall be suitable for 240 V AC supply and shall have low power consumption and shall provide a wide angle of illumination of sufficient intensity for comfortable viewing. A glass of appropriate colour shall be screwed into the front of lamp body. The design of indication lamp shall be such as to facilitate replacement of burnt lamps. An engraved label indicating the purpose of the lamp shall be provided with each lamp.

5.2.19 FERRULES :

Ferrules engraved/printed with the same numbers, of symbols as indicated in the connections and wiring diagram shall be provided on the terminal ends of all wires for identification of circuits for inspection and maintenance. Ferrules shall be of strong and flexible insulating material with glossy finish to prevent adhesion. They shall be engraved/ printed and clearly marked and shall not be effected by dampness. Ferrule numbering shall be in

accordance with IS:375. The same ferrules number shall not be used on wires in different circuits on a panel.

5.2.20 HT TVM:-

3 phase 4 wire A.C. Static H.T. Trivector meter of accuracy class 0.5S for measurement of energy as per latest specification of JVVNL, shall be provided on each Outdoor VCB Kiosks.

Following makes of HT TVMs are acceptable:

i) Secure
ii) L&T
iii) ABB/Elster
iv) Schlumberger
v) Genus Infra
vi) HPL make

Any other make being procured by Nigam shall also be acceptable.

5.2.21 All interiors and exteriors of switchgear enclosure, breaker mechanism etc shall be finished and painted to produce a neat, fire resistant and durable surface which would prevent rusting and corrosion. Sheet metal component shall be pre-treated using 7 tank phosphating process consisting of de-greasing, acid pickling, de-rusting, phosphating and passivation including repeated rinsing in between. On completion of the passivation of the components, they shall be preheated and then epoxy powder coated or treated with one coat of primer & zinc chromate and finished with two coats of light gray enamel paint of shade 631 of IS 5 and stoved to achieve excellent anti-rusting and scratch resistance properties. The thickness of painting shall be around 60 microns.

5.3 SCHEDUOLE OF EQUIPMENTS, FITTING & ACCESSORIES :

12 KV 630 Amps Vacuum circuit breakers kiosks for out door installation :

5.3.1 1 No. - 12 KV 630 Amp. Vacuum Circuit Breaker horizontal fixed type with provision of manual tripping by means of push button and emergency shunt tripping.

Electrically operated through 230 V AC. A lockable Local/ Remote switch shall be provided, apart from Trip-Neutral-Close (TNC switch) control switch to select local/ remote operation of the switchgear. The breaker control switch shall have Trip-Neutral-Close position spring return sequence locking mechanism. The breaker

control switch and selector switch shall be mounted on the front side of cubicle and located at a convenient height for easy operation.

5.3.2 1 No. - AC Motor charged spring operated closing mechanism or magnetic actuator type closing mechanism.

5.3.3 1 No. - Shunt tripping arrangement/ Coil for operation on over current (load) and earth fault by relays along with emergency shunt tripping from remote place in addition to local emergency tripping(Mech.) One additional shunt trip coil, fitted very near to the original coil (which will be unwired) is also required to be provided.

5.3.4 3 Nos. - Single phase 12 KV Current Transformer ratio 400-200-100/5-5A suitable for metering and protection. The class of accuracy shall be 0.5 for metering and 5P15 for protection. Rated burden (output) shall be 15 VA for each secondary winding and it should not be less than suitable for tripping arrangement provided. Instrument security factor for metering core shall not be exceed 5.

5.3.5 6 Nos. - Rigid type bimetallic/ aluminium alloy terminal connector suitable for ACSR (10% Panther and 90% Dog Conductor) for both horizontal/ vertical take-off.

5.3.6 1 No. - Mechanical ON/OFF indicator.

5.3.7 1 No. - Operating handle for independent manual closing mechanism.
5.3.8 1 No. - Red indicating lamp for ON indication.
5.3.9 1 No. - Green indicating lamp for OFF indication.
5.3.10 Spare auxilliary contacts/switch having minimum 4 NO + 4 NC
5.3.11 1 No. - Flush mounting pattern 96x96 sq.mm Moving Iron ammeter of class 1.5 accuracy suitable scaled for 5 Amps. CT secondary.
5.3.12 1 No. - Ammeter selector switch to indicate phase current in all three phases and with OFF position.
5.3.13 1 No. – Numerical 3 O/C + E/F relay.
5.3.14 1 No. HT TVM of accuracy class 0.5S as per latest specification of JVVNL.
5.3.15 2 Nos. - 240 V AC single phase 80 or 100 watt anti condensation heaters with thermostat and switch.
5.3.16 1 No. - Automatic door illumination lamp with switch.
5.3.17 3 Nos. - 11000/110 V single phase voltage transformers each having 100 VA/phase burden & class of accuracy 0.5 suitably connected to meters and indicating instruments etc.

5.3.18 1 No. - Flush pattern switch board mounting pattern 96x96 sq. mm moving iron AC voltmeter of class 1.5 accuracy suitable for 110 V phase to phase secondary suitably scaled.

5.3.19 1 No. - Voltmeter selector switch to indicate phase to phase & phase to neutral voltage of all the three phases.

5.3.20 3 Nos. - Indicating lamps coloured Red,Amber Blue for PT supply.

5.3.21 2 Nos. - Test terminal blocks to test meters and relays with sealing arrangement.

5.3.22 1 No. - Blank lable on the front of kiosks at the top.

5.3.23 Door locks with keys for all doors.

5.3.24 Pair of base channel for grouting in floor.

5.3.25 Arrangement to check healthy trip circuit in all three phases (separate lamps for R phase, Y phase and B phase) be provided.

5.3.26 1 set - Self auxiliary plug and socket.

5.3.27 1 No. - ground bus system, size 50x6mm copper may be provided and the earthing stud shall be capable of withstanding rated short circuit current and stud design shall be as per IS-133427 or IEC -200.

5.3.28 1 No. - Audio-Visual Annunciations.

5.3.29 1 No. - Operation counter.

5.3.30 1 No. - Name plate at front and back of each kiosk.

5.3.31 1 set - 3 phase air insulated main copper bus bar of 630 amp. continuous current rating having maximum current density 1.5 Amp./ MM^2 with minimum cross sectional area 600 MM^2 with PVC insulation or sleeves, STC rating 16 KA for 3 sec.

5.3.32 1 Set -Power Pack arrangement system as specified in cl. No. 5.2.14.

5.3.33 1 No. -Spring Charge Indication Lamp.

The busses within the cubical shall be of high conductivity electrolyte grade copper. The Bus bar joints shall be silver plated and bolted in such a manner that initial contact pressure around the square headed high tensile bolt will remain substantially undiminished at all temperature upto rated full load temperature. The Bus support and bushings shall be of epoxy resin cast type. All drop off from main bus to VCB and VCB to bushing terminations shall be suitable for current rating of circuit breaker . All the bus bar shall be

sleeved with heat shrinkable sleeves of 12 KV voltage level (Insulated for a service voltage of 12 KV) and bus bar shall be shrouded wherever possible. All the bus bar joints shall be shrouded and where shrouding is not possible, it shall be taped with HV self amalgamation tape. All the tap off bus bar connections inside panel and PT jumpers shall be sleeved with HT heat shrinkable sleeves. Special care shall be taken in the design of bus bar system to provide for thermal expansion and to minimize the chances of bus fault. Bimetallic washers shall be provided at the joints of two different metal surfaces.

The bus supports and bushings shall be non hygroscopic non aging glass reinforced polymer.

5.4 MAKE AND TYPE OF BOUGHT OUT ITEMS :

Make / type of each relay, indicating instruments, integrating instruments, control switch for Circuit Breaker/Trip Transfer, selector switch for Voltmeter/Ammeter, Semaphore Indicator, indicating lamps, annunciator, Push Button, A.C. Hooter/Bell, D.C. Hooter, Heater, Link Type Test Terminal Block for testing of TVM, CFL Tube, 2/3 Pin Socket with Switch etc. shall be clearly and invariably indicated in the GTP (Guaranteed Technical Particulars), bill of material and unit price list. Only specific make accessories shall be indicated. The word "EQUIVALENT/REPUTED MAKE" will not be given for consideration.

The other makes of all bought out items shall be acceptable if it is of "ISI Marked" or type tested for which bidder shall furnish attested Photostat copies of ISI Certificate/type test reports not older than **Five years** for the respective make offered, subject to prior approval of SE(MM), JVVNL, Jaipur.

Other standard accessories which are not specifically mentioned but are required to be supplied with circuit breaker kiosk of similar type and rating for efficient and trouble-free operation.

5.5 TEMPERATURE RISE :

The max. temperature rise of various parts of the circuit breakers when tested under rated condition shall not exceed the specified values at a peak ambient temperature of 50 deg.C . The breaker may be provided with silver plated contacts if necessary to meet the requirement of IS:13118/IEC:56 where higher temperature rise is permitted with silver plated contacts. The quantity of silver facing shall be such that after carrying out one tenth of the total number of operations specified for mech. Endurance test, there is a still continuous layer of silver on the contacts. The temperature rise of CTs and

PTs shall also not exceed the permissible values as per relevant Indian standards when corrected for max. ambient temperature at site.

6.0 TESTS :

6.1 TEST BEFORE DESPATCH : The 12 KV vacuum circuit breakers and accessories shall be subjected at maker's works before despatch, to the following tests as per relevant IS/IEC.

A) ROUTINE TESTS ON EACH UNIT AS PER RELEVANT STANDARDS :

(i) One minute power frequency voltage withstand dry test on main circuit.
(ii) Voltage withstand test on control & auxiliary circuits.
(iii) Measurement of the resistance of main circuit.
(iv) Mechanical operating test.
(v) Design and visual checks.

B) The following type tests shall be conducted on the material as per relevant standards:

(i) Dielectric tests.
a) Lightning Impulse Voltage Test.
b) One Minute Power Frequency Test (Wet & Dry).
(ii) Short time withstand current and peak withstand current test.
(iii) Basic short circuit duties test.
(iv) Single phase short circuit test.
(v) Mechanical Operation test as per M-2 class.
(vi) Out of phase making & breaking test.
(vii) Capacitive Current Switching Test.
a) Cable Charging Test.
b) Single Capacitor Bank Current Switching Test.
(viii) Measurement of resistance of main circuit.
(ix) Temp. rise test.
(x) IP-55 Test (For cubicle/control cabinet).
(xi) Any other type tests not specified above but covered as per amendment/latest edition of relevant IS/IEC.

C) The type test reports of Circuit Breakers, Current Transformers, Potential Transformers, Relays, Meters etc. shall be complete in all respect as per relevant IEC/ISS.

6.2 TYPE TESTS :

The 12 KV vacuum circuit breaker kiosk offered shall be fully type tested as per relevant standards.

The bidder must furnish type test reports along with bid as per the qualification requirement of the Tender Specification.

Where permitted in the relevant standard, a test specimen for type test may be a representative sub-assembly/ a representative functional unit. An individual type test is acceptable for a change of constructional detail, for any change in the design/type of type test report and the design/type of offered against this specification, if the manufacturer can demonstrate and purchaser is satisfied that this change does not influence the result of the individual type test. The bidder may bring out in their offer all such changes made in components, materials, design etc. as the case may be. The purchaser will interpret the meanings of drawings and specifications and shall have the power to accept/reject any type test report which in his judgment is/is not in a manner acceptable to him. **The decision of Purchase Committee in this matter shall be final and binding to all.**

However, the purchaser reserves the right to demand repetition of some or all the type tests in presence of purchaser's representative. For this purpose, the bidder should indicate unit rates for carrying out such type tests. These test charges shall not be taken into consideration for bid evaluation.

6.3 TEST ON BOUGHT OUT ITEMS :

Tests are not required to be performed on bought out equipments/items like motor, terminal connector, etc. at the works of manufacturer. Furnishing Test Certificate of these items from the original equipment manufacturers shall be deemed to be satisfactory evidence. Inspection of the tests at Sub-contractors works will be arranged by the supplier whenever required.

6.4 ROUTINE/ACCEPTANCE TESTS :

(i) The following acceptance and routine tests shall be got conducted in presence of purchaser's representative as per stipulation of the relevant standards, on each unit.

a) One minute power frequency voltage withstand dry test on main circuit.
b) Voltage withstand test on control & auxiliary circuits.
c) Measurement of the resistance of main circuit.
d) Mechanical operating test.

e) Design and visual checks

(ii) Inspection & tests on control gear.

In addition to the above tests at 6.4 (i) above specified by IEC, the following shall also be performed at manufacturer's works in presence of purchaser's representative after completely assembling the kiosk.

a) Checking wiring of circuits and their contacts.
b) Insulation resistance of complete wiring, circuit by circuit with all equipment mounted on the panels.
c) Checking of operational protective schedule , instruments and meters.
d) Checking of phase faults between R&Y, Y&B and B&R phases. Kiosk should trip under all three conditions.
(iii) **Temp. rise test on one No. Kiosk in the first offered lot shall also be done in the presence of the purchaser's representative**.
(iv) Any other tests not specified above but covered as per amendment/latest edition of relevant IS/IEC.

6.5 TOLERANCE ON TEST RESULTS :

As per relevant standards/specification.

6.6 TEST AT SITE :

The purchaser reserves the right to conduct all tests on 12 KV circuit breakers after arrival at site and the contractor shall guarantee test certificate figures under actual service conditions.

7.0 INSPECTION :

All the tests (as mentioned at Clause 6.4) and Inspection shall be made at the place of manufacturer unless otherwise especially agreed upon by the bidder and purchaser at the time of purchase. The bidder shall afford the inspection officer(s) representing the purchaser all reasonable facilities without charges, to satisfy him that the material is being furnished in accordance with this specification. The purchaser has the right to have the tests carried out at his own cost by an independent agency whenever there is a dispute regarding the quality of supply.

The Inspection may be carried out by the purchaser at any stage of manufacture/ before despatch as per relevant standard.

Inspection and acceptance of any material under the specification by the purchaser, shall not relieve the bidder of his obligation of furnishing material in accordance with the specification and shall not prevent subsequent rejection if the material is found to be defective. The Bidder shall keep the purchaser informed in advance, about manufacturing programme so that arrangements can be made for inspection.

The purchaser reserves the right to insist for witnessing the acceptance/ routine testing of the bought out items.

The Bidder shall give 15 days advance intimation to enable the purchaser to depute his representative for witnessing the acceptance and routine tests.

8.0 QUALITY ASSURANCE PLAN

8.1 The tenderer shall invariably furnish following information along with his offer, failing which his offer shall be liable for rejection. Information shall be separately given for individual type of equipment offered.

(i) Statement giving list of important raw materials names of sub-suppliers for the raw materials, list of standards according to which the raw materials are tested. List of tests normally carried out on raw materials in presence of tenderer's representative, copies of test certificates.

(ii) Information and copies of test certificates as in (i) above in respect of bought out accessories.

(iii) List of manufacturing facilities available.

(iv) Level of automation achieved and list of areas where manual processing exists.

(v) List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such tests and inspections.

(vi) Special features provided in the equipment to make it maintenance free.

(vii) List of testing equipments available with the tenderer for final testing of equipment specified and test plant limitation. If any, vis-a-vis the type, special acceptance and routine tests specified in the relevant standards. These limitations shall be very clearly brought out in schedule of deviations from specified test requirements.

8.2 The successful tenderer shall within 30 days of placement of order, submit following information to the purchaser.

(i) List of raw materials as well as bought out accessories and the names of sub-suppliers selected from those furnished along with offer.

(ii) Type test certificates of the raw material and ought out accessories.

(iii) Quality assurance plan (QAP) with hold points for purchaser's inspection. The quality assurance plan and purchasers hold points shall be discussed between the purchaser and supplier before the QAP is finalized.

8.3 The successful bidder shall submit the routine test certificates of bought out accessories and central excise passes for raw material viz oil, copper, aluminium, conductors, insulating materials, core material at the time of routine testing of the fully assembled equipment.

9.0 DOCUMENTATION

9.1 All drawings shall conform to International Standards Organization (ISO) `A', series of drawing sheet/Indian Standards specification IS:13118/IEC-56. All drawings shall be in ink and suitable for micro filming. All dimensions and data shall be in S. I Units.

9.2 List of drawings and documents

The bidder shall furnish four sets of following drawings along with his offer.

a) General outline and assembly drawings of the equipment i.e. breaker, CTs,PTs etc.

b) Graphs showing the performance of equipments in regard to magnetization characteristics.

c) Sectional views showing -
i) General Constructional features.
ii) the materials/ gaskets /sealings used.
iii) the insulation, the winding arrangements, method of connection of the primary/secondary winding to the primary /secondary terminals etc.
iv) porcelain used and its dimensions along with the mechanical and electrical characteristics.

d) arrangement of terminal's and details of connection studs provided.

e) Name Plate

f) Schematic drawing

g) Type test reports in case the equipment has already been type tested.

h) Test reports, literature, pamphlets of the bought out items, and raw material.

9.3 The successful tender shall, within 2 weeks of placement of order, submit three sets of final versons of all the above said drawings for purchaser's approval. The purchaser shall communicate his comments/approval on the drawings to the supplier within four weeks. The supplier shall, if necessary, modify the drawings and resubmit three copies of the modified drawings for owners approval with in two weeks from the date of owner's comments. After receipt of owner's approval, the supplier shall within two weeks, submit 12 prints and two good quality reproducibles of the approved drawings for purchasers use.

9.4 Six sets of the type test reports, duly approved by the purchaser, shall be submitted by the supplier for distribution before commencement of supply. Adequate copies of acceptance and routine test certificate, duly approved by the purchaser shall accompany the despatch consignment.

9.5 The manufacturing of the equipments shall be strictly in accordance with the approved drawings and no deviation shall be permitted without the written approval of the purchaser. All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawing shall be at the supplier's risk.

9.6 16 sets of nicely printed and bound volumes of operation, maintenance and erection manuals in English language, for each type and rating of equipment supplied shall be submitted by the supplier for distribution, prior to the despatch of the equipment. The manual shall contain all the drawings and information required for erection, operation and maintenance of the circuit breaker. The manual shall also contain a set of all the approved drawings, type test reports etc.

9.7 Approval of drawings/work by purchaser shall not relieve the supplier of his responsibility and liability for ensuring correctness and correct interpretation of the drawings for meeting the requirement of the latest revision of applicable standards, rules and codes of practices. The equipment shall conform in all respects to high standards of engineering, design, workmanship and latest revisions of relevant standards at the time of ordering and purchaser shall have the

power to reject any work or materials which, in his judgement is not in full accordance therewith.

10. PACKING AND FORWARDING

10.1 The equipments shall be packed in crates suitable for vertical/horizontal transport as the case may be, and suitable to withstand handling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit, due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with the appropriate caution symbol. Wherever necessary, proper arrangement for lifting, such as lifting hooks etc. shall be provided. Any material found short inside the packing cases shall be supplied by supplier without any extra cost.

10.2 Each consignment shall be accompanied with a detailed packing list containing the following information :

a) Name of the consignee.
b) Details of consignment
c) Destination
d) Total weight of consignment.
e) Sign showing upper/lower side of the crate.
f) Handling and unpacking instructions.
g) Bill of material indicating contents of each package.

10.3 The supplier shall ensure that the packing list and bill of material are approved by the purchaser before despatch.

11.0 Optional Spares

The bidder shall also recommend optional spares that will be required for breakers along with their total and unit prices. However, the prices of operation spares will not be considered for bid evaluation.

12.0 PERFORMANCE WARRANTY PERIOD :

The performance warranty period shall be **5 (Five) years** from the date of receipt of equipment along with its all accessories.

The supplier will be required to furnish a Performance Bank Guarantee @ 10% (for new suppliers)/ @ 5% (for old & established suppliers) amount of the total ordered value, which is required to be valid for 5 years.

Successful bidder shall attend the complaint within 30 days from the date of receipt of complaint. The date of receipt of complaint shall be treated as the date of FAX/ 3 days from the date of despatch of complaint by the field officer/ stores/ Purchaser. If the supplier fails to attend the complaint within 30 days from the date of receipt of complaint intimated by the field officer/ purchaser then penalty @1/4% per week or part thereof for first 4 weeks in case delay is exceeds more than 4 weeks then @1/2% per week or part thereof shall be charged for entire delay, subject to a maximum of 5% of the breaker. This penalty will be in addition to the penalty leviable delay in delivery mentioned in purchase order.
Further to this, in case of emergency, breaker can be get rectified by the field officer at the risk & cost of the supplier firm. The rectification of breaker means satisfactory performance report duly signed by the field officer (AEn/JEn) i.e. incharge of 33/11 KV Sub-Station.

13.0 Delay in Delivery of Inspected Material at Store :

If the material are not delivered within 7 days at same station, 14 days for station within State and 20 days by the suppliers situated outside the State from the date of receipt of the Dispatch Instructions. Charges shall be recovered @ Half Percent per week or part thereof (for actual delay in receipt), maximum upto 3% of the Dispatch Instructions consignment value (Ex-works). This will be in addition to Clause No.1.24(1) of GCC.

14.0 PAYMENT:-

100 % (Hundred percent) payment of each consignment shall be made along with taxes & duties by the concerned Sr. Accounts Officer/ Accounts Officer (CPC), subject to furnishing of SBG, PBG in terms of relevant clause of GCC and Bank Guarantee of 10% cost of breaker towards satisfactory installation & commissioning of 12 KV Outdoor VCB Kiosks. The Bank Guarantee of 10% cost of breaker shall be released on production of satisfactory Installation & Commissioning certificates from the Nodal Officer and deposition of penalty towards delay in Installation & Commissioning of Breaker.

However, if intimation of site is not conveyed to the supplier by the Nigam upto one year of receipt of material in store, retention amount of supply of VCB/ BG of 10% cost of breaker, may be released.

15.0 FURNISHING OF PROTO TYPE BREAKER:-

One Proto Type 12 KV Outdoor VCB Kiosk conforming to various requirements of technical specification along with subsequent modifications made, has to be supplied by the successful bidder within two months of placement of detailed purchase order for our inspection & approval. The offer for inspection of subsequent material shall be entertained only after approval of proto type VCB Kiosk and successful bidder will have to complete the entire ordered quantity within **six months** of approval of proto type VCB Kiosk. Prior to supply of prototype VCB Kiosk, the detailed drawings, Bill of Material & protection scheme shall be got approved.

In case if there is delay in furnishing of proto type VCB by the firm for our inspection beyond 60 days, the delivery schedule shall be reduced by the number of days for which above delay was occurred. Further, in case successful bidder does not get its proto type approved within one year from the date of receipt of detailed Purchase Order or initial contractual delivery period whichever occurs earlier, then in such case it will be treated as failure of supply of material on part of the firm and action as per the provision of P.O. will be initiated.

The proto type sample shall be inspected by a team of two officers including one from M&P Wing.

If the bidder has already got approved Proto type sample in the previous tender with similar specification of the instant tender, furnishing of fresh proto type sample is not required.

16.0 QUANTITY :

12 KV OUTDOOR VCB KIOSKS : **1,500 Nos.**

The quantity as indicated above is approximate and may be increased or decreased to any extent at the time of finalization of this tender enquiry.

SECTION-III (PART-B)

1 SCOPE

This specification is intended to cover the installation & commissioning of 12 KV Outdoor Vacuum Circuit Breaker (Kiosks), complete in all respect at various 33/11 KV Sub-Stations under Jaipur Discom/Ajmer Discom/Jodhpur Discom.

2.0 INSTALLATION & COMMISSIONING OF VCB

The 12 KV Outdoor Vacuum Circuit Breaker Kiosks supplied shall be installed & commissioned by the successful bidder, at various 33/11 KV Sub-Stations under Jaipur Discom/ Ajmer Discom/ Jodhpur Discom. The name of 33/11 KV Sub-Stations shall be intimated at the time of dispatch instructions/ stores.

3.0 ACTIVITY

The following main activities are to be carried out by the supplier for installation & commissioning of 12 KV Outdoor Vacuum Circuit Breaker Kiosks:-

a) Foundation of Bolts along with grouting.
b) Installation & Commissioning of Kiosk.
c) Laying & connection of control cables from breaker to Control & Relay panel (Control cables shall be supplied by Nigam).
d) Connection of Earthing of breaker from the earth mesh of the GSS. Providing M.S. flat shall be in the scope of supplier.
e) All Civil works related with foundation and installation & commissioning of 12 KV Outdoor VCB Kiosks.

Note:- The M.S. Earthing & Foundation bolts required for Installation & Commissioning shall be provided in a packet and shall put up in each breaker.

4.0 CIVIL FOUNDATION WORK:-

The foundation & grouting work along with all civil works required for installation of 12 KV outdoor vacuum circuit breaker kiosk shall be carried out by the supplier. The foundation drawing shall be furnished by the successful bidder(s), which shall be approved by SE(MM) in consultation with SE(Civil).

5.0 INSTALLATION & COMMISSIONING OF KIOSK

Installation & commissioning of 12 KV Outdoor Vacuum Circuit Breaker Kiosks complete with accessories including use of special tools & conducting all pre-

commissioning tests before energisation shall be carried out by the supplier. PG/T-Clamps of required size to connect incoming & outgoing terminals of VCB to main bus bar shall be arranged by the supplier, however, required ACSR conductor for jumpers shall be arranged by the Nigam.

The agency should engage team of experienced Engineers & skilled staff for the purpose of Installation & Commissioning of 12 KV Outdoor Vacuum Circuit Breaker Kiosks.

Mainly following pre-commissioning tests shall be carried out:-

a) Visual inspection.
b) Cleaning
c) Testing of relays/ CTs/PTs.
d) Testing of current circuitry by primary injection
e) Testing of breaker by primary injection.
f) IR value.
g) Checking of various equipments viz. Ammeter, Voltmeter, Energy meter etc. and alarms/ flags/ trip circuit healthiness etc.

6.0 NODAL OFFICER:

The concern Assistant Engineer/Feeder Manager of M&P shall be the Nodal officer for supervision of installation & commissioning of 12 KV Outdoor Vacuum Circuit Breaker Kiosks.

7.0 WORK COMPLETION SCHEDULE

The Installation & Commissioning of 12 KV Outdoor Vacuum Circuit Breaker Kiosks shall be completed within 30 days from the date of receipt of intimation of location of 33/11 KV Sub-Stations where the supplied breakers are to be installed. The concerned Nigam's officer shall give intimation to the firm only after transporting the breaker to Sub-Station/Site.

8.0 DELAY IN WORK COMPLETION:

In case of delay in Installation & Commissioning of breaker beyond 30 days from the date of intimation to the supplier about the site (the date of receipt of intimation shall be treated as the date of FAX/ 3 days from the date of despatch of letter about intimation of site by the field officer/ stores/ Purchaser), Only 50% payment towards installation & commissioning charges of breaker will be payable and in case the supplier fails to complete installation & commissioning of the breaker within 60 days, no payment towards installation & commissioning will be

payable and breaker will be installed & commissioned by the Nigam itself and penalty towards non-installation of breaker @ 10% cost of breaker shall be levied.

9.0 **PAYMENT:-**

The payment shall be released on production of satisfactory installation & commissioning report of 12 KV Outdoor Vacuum Circuit Breaker Kiosks duly verified by the Nodal Officer.

The payment shall be released by Sr.A.O. (CPC) on production of satisfactory installation & commissioning report of 12 KV Outdoor VCB Kiosks duly verified by the concerned Assistant Engineer/ Feeder Manager of M&P Wing.

While issuing the Installation & Commissioning Report, the nodal officer should ensure that activities as per clause No. 3.0 of Schedule-III (part-B) have been completed by the supplier. If the Installation & Commissioning of Breaker has been done on the existing foundation of the sub-station, then only 50% payment of the total Installation & Commissioning charge shall be admissible and accordingly the payment will be made by the Sr. A.O. (CPC).

10.0 **PRICES:**

Installation & Commissioning charges shall be on FIRM price basis. In the price schedule, the bidder shall quote separately the prices for supply of 12 KV Outdoor Vacuum Circuit Breaker Kiosks, Installation & Commissioning charges inclusive of all type of taxes & service charges, if any and cost of Civil Works per breaker.

Work Contract Tax (WCT), if applicable, shall be borne by the Nigam.

11.0 **Security bank Guarantee towards Installation & Commissioning:**

Successful bidders shall furnish Bank Guarantee equivalent to 10% cost of breaker, towards successful installation & commissioning, which should be initially valid for a period of one year and if bidders fail to carry out installation & commissioning work of breaker in time, Nigam may invoke their Bank Guarantee.