

Office of the
General Manager, Electrical
North Eastern Railway

Dated 19/08/17

R.N. Garg
Dy CEE/Coaching.

1955-56
The first year of the project was spent in the field, collecting data on the distribution and abundance of the various species of fish in the lake. The second year was spent in the laboratory, analyzing the data and preparing the report.

North Eastern Railway
Electrical Department

Specification No. CEE/CSS/17, June 2017
Specification for 11/0.415 KV Package type Compact Substation (CSS)

- 1.0 Scope:** This specification covers the design, supply, Testing & commissioning of compact substation as integral unit comprising of Oil filled/Dry Type distribution transformer (63 KVA-2000 KVA), HT Panel comprising of 11 KV Non-Ext SF6 Insulated RMU with Vacuum Circuit Breaker as protection, Transformer, Low voltage Switchgear & Earthing along with all other accessories as required (HT switchgear, Transformer , LT Switchgear will be of same OEM).
- 2.0 Nature of Electric Supply :**
 Incoming - 11000 Volts, 3 Phase, 3 Wire & 50 cycle per second.
 Outgoing - 415 Volts, 3 Phase, 4 Wire & 50 cycle per second.
 Solidly Earthed Neutral.
- 3.0 Rated KVA:** The Rated KVA of the Package type Compact Substation (CSS) shall be as per schedule of Rate & Quantity.
- 4.0 Code & Standards :**
- 4.1** All equipment and material shall be designed manufactured and tested in accordance with the latest applicable IEC standards. The 12KV Package Substation Design must be as per IEC 61330.
- 4.2** The package Sub-station offered shall in general comply with the latest issues including amendments of the following standards.

Title	Standards
High Voltage, Low Voltage Pre-Fabricated Substation	IEC: 62271-202
High Voltage Switches	IEC:60265/IS 13118,IS 3427
Metal Enclosed High Voltage Switchgear	IEC: 60298 / IEC:62271-200
High Voltage Switchgear	IEC: 60694
Low Voltage Switchgear and Control gear	IEC: 60439
Power Transformers	IEC: 60076
Code of Practice for selection,Installation and maintence of switchgear	IS:10118
Indian electricity rules	2005
Indian Electricity Act	2003

5.0 Design Criteria:

- 5.1** Package Sub-station consisting of 11KV Non Extensible VCB Ring Main Unit with VCB as protection +Transformer +Low Voltage Switchgear with all connection accessories, fitting & auxiliary equipment in an enclosure to supply low voltage energy from high voltage system as detailed in this specification. The complete unit shall be installed on a substation plinth (Base) as outdoor sub-station. 11KV

CSS-1

[Signature]
19/06/17

[Signature]
19/06/17
SSE/P

isolators controls incoming -outgoing feeder cables of the 11KV distribution system. The Vacuum Circuit Breaker shall be used to control and isolate the 11KV/433V Distribution transformer. The transformer Low Voltage side shall be connected to Low Voltage Switchgear. The connection cables to consumer shall taken out from the low voltage switchgear.

- 5.2** The prefabricated -package substation shall be designed for (a.) Compactness, (b.) Fast Installation, (c.) Maintenance free operation, (d.) Safety for worker/operator & public.
- 5.3** The Switchgear and component thereof shall be capable of withstanding the mechanical and thermal stress of short circuit listed in ratings and requirements clause without any damage or deterioration of the materials.
- 5.4** For continuous operation at specified ratings temperature rise of the various switchgear components shall be limited to permissible valued stipulated in the relevant standard and/or this specification.

5.5 Service Condition:

The Package sub-station shall be suitable for continuous operation under the basic service conditions indicated below.

Ambient Temperature	:	50°C
Relative Humidity	:	up to 95%
Altitude of insulation	:	up to 1000 m.

The Enclosure of high voltage switchgear -control gear, Low voltage switchgear-control gear & transformer of package substation shall be designed to be used under normal outdoor service condition as mentioned. The enclosure should take minimum space for the installation including the space required for approaching various door & equipment inside.

6.0 Specific Requirement:

- 6.1** The main components of a prefabricated - package substation are transformer, High - Voltage switchgear -control gear, Low - Voltage switchgear -control gear and corresponding interconnections (cable, Flexible, Bus-bar) & auxiliary equipment. The components shall be enclosed, by either common enclosure or by an assembly of enclosure. All the components shall comply with their relevant IEC standards.

6.2 Ratings:

Description	Unit	Value
Rated Voltage/Operating Voltage	KV rms	11
Rated frequency & Number of Phases	Hz & Nos.	50 & 3
Rated maximum power of substation	KVA	(63-2000) KVA as required at site.
Rated Ingress protection class of Enclosure	IP	IP-23 for Transformer compartment and IP-54 for LT Switchgear & HT Switchgear Compartment.
Rated Temperature Class of Transformer component		K20

CSS-2

[Signature]
19/10/17
[Stamp]

[Signature]
19/10/16
SSEIP

HV Insulation Level		
Rated withstand Voltage at power frequency of 50 Hz	KV rms	28
Rated Impulse withstand Voltage	KV Peak	75
HV Network & bus-bar		
Rated Current	Amp.	630A
Rated Short time withstand current	kA rms/ 1sec.	21
<u>Making capacity for switch disconnector & earthing switches.</u>	kA Peak	52.5 kA
Breaking capacity of isolator (rated full load)	Amp.	630A
LV Network		As per BOQ

Outdoor Enclosure

7.0 Outdoor enclosure:

- 7.1 The enclosure shall be made of Galvanized sheet steel tropicalised to local weather condition.
- 7.2 The metal base shall ensure rigidity for easy transport & installation.
- 7.3 The protection degree of the enclosure shall be IP54 for LT & HT switchgear compartment & IP 23 for transformer compartment. Proper/adequate ventilation aperture shall be provided for natural ventilation by way of Louvers etc . Transformer compartment has to be designed in such a way that, it meets IP class without any forced cooling arrangements.
- 7.4 The doors shall be provided with proper interlocking arrangement for safety of operator.
- 7.5 The HV & LV outgoing of the transformer are to be connected to Vacuum Circuit Breaker of RMU & incomer of the Low Voltage Switchgear by means of Copper Cables/ Flexible Bus-bars.
- 7.6 Internal Fault : Failure within the package substation due to a defect, an exceptional service condition or mal-operation may initiate an internal arc. Such an event may lead to the risk of injury, if person are present. It is desirable that the highest practicable degree of protection to person shall be provided. The Design shall be tested by CPRI for 21 KA for 1 sec (of IAC AB criteria) as per IEC 62271-202. Type test report of arcing due to internal fault should be submitted with offer.
- 7.7 Covers & Doors: Covers & doors are part of enclosure. When they are closed, they shall provide the degree of protection specified for the enclosure. Ventilation opening shall be so arranged or shielded that same degree of protection as specified for enclosure is obtained. Additional wire mesh may be used with proper Danger Board for safety of the operator. All covers, doors or roof shall be provided with locking facility or it shall not be possible to open or remove them before doors used for normal operation have been opened. The doors shall open outward at an angle of at least 90° & be equipped with a device able to maintain them in an open position.

CSS-3

[Signature]
19/06/22

[Signature]
19/6
CSEIP

- 7.8 Earthing :** All metallic components shall be earthed to a common earthing point. It shall be terminated by way of flexible jumpers/strips & Lug arrangement. The continuity of the earth system shall be ensured taking in to account the thermal & mechanical stresses caused by the current it may have to carry. The components to be connected to the earth system shall include:
- (a.) The enclosure of Package Substation.
 - (b.) The enclosure of high voltage switchgear & control gear from the terminal provided for the purpose.
 - (c.) The metal screen & the high voltage cable earth conductor.
 - (d.) The transformer tank or metal frame of transformer.
 - (e.) The frame &/or enclosure of Low Voltage Switchgear.
- 7.9** There shall be an arrangement for internal lighting activated by associated switch for HV, Transformer & LV compartment.
- 7.10** Labels: Labels for warning, manufacturer's operating instruction etc. shall be durable & clearly legible.
- 7.11** Cleaning & Paint : The paints shall be carefully selected to withstand tropical heat and rain. The paint shall not scale off or crinkle or be removed by abrasion due to normal handling.

11 KV Non -Ext SF6 RMU with Vacuum Circuit Breaker

- 8.0** This RMU should be complete with all components necessary for its effective and trouble free operation along with associated equipment etc. such components should be deemed to be within the scope of supplier's supply. The RMU should be fixed type SF-6 insulated, Vacuum circuit breakers with O/C & E/F relay for the protection of the transformer. It should be maintenance free equipment, having stainless steel robotically welded IP67 enclosure.

8.1 STANDARDS AND REFERENCE DOCUMENTS

Codes and Standards

The RING MAIN UNIT (RMU) should be designed, manufactured and tested according to the latest version of:

- IEC 60694 Common specifications for high-voltage switchgear and control gear standards.
 - IEC 60298/ IEC 62271-200 : A.C metal-enclosed switchgear and control gear for rated voltages above 1KV and up to and including 72KV and the IEC Codes herein referred.
 - IEC60129/IEC62271-102: Alternating current disconnections (isolators) and earthing switches
 - IEC60529: Classification of degrees of protection provided by enclosures
 - IEC 60265 High-voltage switches-Part 1: Switches for rated voltages above 1kV and less than 52 kV
 - IEC 60056: Circuit breakers
 - IEC 60420: High-voltage alternating current switch-fuse combinations
 - IEC 60185: Current transformers
 - IEC 60186: Voltage transformers
 - IEC 60255:Electrical relays
- Any other codes recognized in the country of origin of equipment might be considered provided that they fully comply with IEC standards.

CSS-4

[Signature]
21/06/17

[Signature]
21/6/16
-IP

The design of the switchgear should be based on safety to personnel and equipment during operation and maintenance, reliability of service, ease of maintenance, mechanical protection of equipment, interchangeability of equipment and ready addition of future loads.

8.2 Salient Technical feature of "SF-6 RMU."

11KV SF6 INDOOR, NON-EXTENSIBLE, Ring Main Unit (RMU), comprising of one 630 A Vacuum "T"OFF Circuit Breaker with (3 O/C & 1E/F) Relay.

(A) Load break switch (630A)

Load break switch should have the following

- Manually operated 12 KV, 630A Load Break switch and Earthing Switch with making capacity
- "Live Cable" LED Indicators through Capacitor Voltage Dividers mounted on the bushings.
- Mechanical ON/OFF/EARTH Indication
- Anti-reflex operating handle
- Cable testing possible without disconnection of cables.
- Cable boxes suitable for 1R X 3C x 300 sq mm XLPE Cable with right angle Cable terminal Protectors.
- Cable boxes should be Arc Proof and interlocked with respective Earthing Switches for safety of operator it should not be possible to open the cable box unless the earth switch is ON

(B) Circuit Breaker. (630 A)

Circuit Breaker should have the following:

- Manually operated 630 A Vacuum circuit breaker and Earthing Switch with making capacity
- Mechanical tripped on fault indicator
- Auxiliary contacts 1NO and 1NC
- Anti-reflex operating handle
- "Live Cable" LED Indicators thru Capacitor Voltage Dividers mounted on the bushings.
- 3O/C + 1E/F self-powered relay with Low and High set for over current and Earth Fault. Relay should have facility to display the maximum loaded phase current also. Relay should have facility to trip the breaker from remote commands without shunt trip coil.
- Mechanical ON/OFF/EARTH Indication

(C) Indoor RMU

1. Modular design, panel type with front cable access.
2. RMU must be made of robotically welded stainless steel with all live parts inside stainless steel tank
3. Offered RMU must be Non extensible.
4. Maximum Modules can be accommodated in a single Stainless steel Tank so as to make it more compact and reliable.

CSS-5

[Signature]
19/06/17

[Signature]
19/06/17
-10

5. Cable covers must be interlocked with Earth switch to have complete safety of operating person

8.3 DIELECTRIC MEDIUM

SF6 GAS shall be used for the dielectric medium for 11KV RMU's in accordance with IEC376. It is preferable to fit an absorption material in the tank to absorb the moisture from the SF6 gas and to regenerate the SF6 gas following arc interruption. The SF6 insulating medium shall be constantly monitored via a temperature compensating gas pressure indicator offering a simple go, no-go indication. The RMU should have provision of Gas filling at site, in case there is some leakage of the gas.

8.4 GENERAL TECHNICAL REQUIREMENT

1. Fixed type Vacuum breakers insulated in SF6 gas. It should be maintenance free, having stainless steel robotically welded enclosure for INDOOR RMU application.
2. Low gas pressure devices- 1.4 Bar pressure. RMU should have full rating with 0.0 Bar gas pressure.
3. Live cable indicators- High operator safety.
4. Fully rated integral earthing switch for Switches and Breakers.
5. Self-powered Microprocessor Based 3O/C + 1E/F self-powered relay with Low and High set for Over current and Earth Fault - Does not require any external source of power.
6. Units fully SCADA Comaptible. Retrofitting at site possible at a later date. Line switches (Load break switches) as well as T- OFF circuit Breaker can be operated by remote.
7. Cable boxes should be front access and interlocked with earth switch. No rear access required.
8. Cable testing possible without disconnection of cables.
9. Compact in dimension.
10. Low pressure, sealed for life equipment,
11. 8.4.11 Cable earthing switch on all switching device-standard, for operator safety.
12. All live parts should be inside a hermetically sealed Stainless Steel enclosure for indoor RMU.
13. Indoor unit should be classified as sealed pressure system with gas leak rate of less that 0.1% per year requiring no gas filling for 20+ years of functional life.

8.5 TECHNICAL AND GUARANTEED PARTICULARS.

The bidders shall furnish all guaranteed technical particulars as called for this specification.

9.0 DESIGN CRITERIA

9.1 Service conditions

The offered switchgear and control gear should be suitable for continuous operation under the basic service conditions indicated below. Installation should be in normal indoor conditions in accordance with IEC 60694.

Ambient temperature -10C to +45oC

CSS-6

[Handwritten signature]
10/6/17

[Handwritten signature]
10/6/17
RECEIVED

31-P

Relative humidity up to 95%
Altitude of installation up to 1000m, IEC 60120

9.2

The offered RMU should be of the fully arc proof metal enclosed, free standing, floor mounting, flush fronted type, consisting of modules assembled into one or more units. Each unit is made of a cubicle sealed-for life with SF6 and contains all high voltage components sealed off from the environment. The overall design of the switchgear should be such that front access only is required. It should be possible to erect the switchboard against a substation wall, with HV and LV cables being terminated and accessible from the front. The units should be constructed from stainless steel sheets. The design of the units should be such that no permanent or harmful distortion occurs either when being lifted by eyebolts or when moved into position by rollers.

The cubicle should be have a pressure relief device. In the rare case of an internal arc, the high pressure caused by the arc will release it, and the hot gases is allowed to be exhausted out at the bottom of the cubicle. A controlled direction of flow of the hot gas should be achieved.

The switchgear should have the minimum degree of protection (in accordance with IEC 60529)

- IP 67 for the tank with high voltage components
- IP 2X for the front covers of the mechanism
- IP 3X for the cable connection covers

10.0 TECHNICAL DATA

10.1 Ring Main Unit, Electrical data

Electrical data and service conditions

No *Rated voltage*

	KV	12KV
1 Power frequency withstand voltage	KV	28
2 Impuls withstand voltage	KV	75
3 Rated frequency	Hz	50
4 Rated current busbars	A	630
5 Rated current (cable switch)	A	630
6 Rated current (T-off)	A	630

Breaking capacities:

7 active load	A	630
8 closed loop (cable switch)	A	630
9 off load cable charging (cable switch)	A	135
10 earth fault (cable switch)	A	200
11 earth fault cable charging (cable switch)	A	115
12 short circuit breaking current (T-off circuit breaker) kA	20	
13 Rated making capacity	kA	50

CSS-7

Signature
19/06/17

Signature
19/06/17
-CEP

tank. The operating shafts for the switches should be have rotary seals where they enter the SF6 cubicle. The operating mechanisms should be located outside on the front of the SF6 tank. Cable bushings should be located on the front of the SF6 cubicle in a separate cable compartment. Front covers containing the mimic diagram and having a degree of protection IP2XC close the fronts.

11.1.1 The T-off circuit breaker module (630 A)

The T-off circuit breaker module should be consisting of an SF6 cubicle housing a Vacuum circuit breaker unit and a disconnector- ear thing switch. An integrated relay and related CTs is used for tripping of the circuit breaker. Bus bars and all electrical connections should be located inside the tank. The operating shafts for the switches should be have rotary seals where they enter the SF6 cubicle. The operating mechanisms are located outside on the front of the SF6 tank. Cable bushings should be located on the front of the SF6 cubicle in a separate cable compartment. Front covers containing the mimic diagram having a degree of protection IP2X seal off the fronts.

Off load isolator shall be provided after the Vacuum circuit breaker for maintenance purpose.

11.2 CIRCUIT BREAKERS

Vacuum bottles should be use as interrupters of the currents. The circuit breaker main circuit should be connected in series with a three-position disconnector –ear thing switch. The operation between circuit breaker and disconnector ear thing must be interlocked.

1. VCB must self-tripping and has a self-powered relay
2. The RMU must be non-extensible type

12.0 OTHER MAIN FEATURES

12.1 *Bus bars*

Comprising the 3 single phases copper bus bars and the connections to the switch or vaccum circuit breaker. The bus bar should be integrated in the cubicle Bus bars should be rated to withstand all dynamic and thermal stresses for the full length of the switchgear.

12.2 *The cable switch*

It should be a switch-disconnector and ear thing switch using SF6 gas as an arc-quenching medium. The switch positions are closed – open – earthed. In the open position the switch satisfies the disconnector requirements.

12.3 *Earthing Switch*

Earthing switches should be rated equal to the switchgear rating. Earthing switches should be quick make type capable of making Rated Fault Current. Ear thing switch should be operated from the front of the cubicle by means of a removable handle.

12.4 *The mechanisms*

All mechanisms should be situated in the mechanism compartment behind the front covers outside the SF6-tank. The mechanism for the switch and the earthing switch is operating both switches via one common shaft. The

CSS-9

[Signature]
19/06/17

[Signature]
19/06/17
SSE/PA

550103/2022/O/o CEGE/HQ/NER

mechanism provide independent manual operation for closing and opening of the switch, independent closing of the earthing switch and dependent opening of the earthing switch.

The mechanism for the T-off switch and earthing switch is operating both switches via one common shaft. The mechanism has stored spring energy and provide independent manual operation for closing and opening of the switch, independent closing of the ear thing switch and dependent opening of the ear thing switch. The mechanism for the vacuum circuit breaker (VCB) and disconnector- earthing switch is operating the VCB and the disconnector earthing switch via to separate shafts. The mechanism for the VCB has stored spring energy and provides independent manual operation for closing and opening of the VCB. The mechanism has a relay with related CT's and/or remote tripping device. The mechanism for the disconnect earthing switch provide independent manual operation for closing and opening of the disconnect, independent closing of the earthing switch and dependent opening of the earthing switch.

12.5 *Front covers*

The front cover contains the mimic diagram of the main circuit with the position indicators for the switching devices. The voltage indicators are situated on the front panels. Access to the cable bushings is in the lower part of each module.

12.6 *Position indicators*

The position indicators are visible through the front cover and are directly linked to the operating shaft of the switching devices.

12.7 *Voltage indicator*

The voltage indicators are situated on the front cover, one for each module, and indicate the voltage condition of each incoming cable. Identification of the phases is achieved with labels L1, L2 and L3 on the front of the voltage indicators. The voltage indicator satisfies the requirements of IEC61243.

12.8 *Cable compartment*

It should be possible to terminate up to a 1x 3c x300sqmm core HV cables in each cable compartment. The access to the compartment will be possible by removing the cable cover, Hinged to the main frame only when earth switch is ON. Cable Compartments of Indoor RMU should be Arc Proof and interlocked with respective Earth Switches.. Each module has a separate cable compartment that is segregated from each other by means of a partition wall. A partition wall should be fitted to divide the cable compartment from the rear side-of the switchgear. In case of an arc inside the tank, followed by the opening of the pressure relief, the partition wall prevents the hot gases flowing out from the pressure relief to enter the cable compartments. All covers are removable. The ground continuity is achieved when the covers are in place by means of hinged connections.

Interconnection between HT switchgear and transformer shall be through suitable copper bus bar / copper cable.

12.9 *Power connection.*

CSS-10

19/06/17
 ॐ श्री गणेशाय नमः
 Mr. Chief Elec. Engineer (General)

19/06/17

550103/2022/O/o QEEG/HQ/NER

The cables are installed in the dedicated compartment below the mimic front cover. At the bottom of the cable compartment, an earthing bar system made of copper/GI with a minimum cross section of 120 mm² should be fitted. In each compartment the earthing bar should be fitted with 4 screws M10. The earthing system is connected to the tank by a copper/GI bar, which rises up to the connecting point of the tank behind the rear partition wall on the middle of the switchgear

12.10 INTERLOCKING.

The mechanism for the cable switch should be provide a built in interlocking system to prevent operation of the switch when the earthing switch is closed, and to prevent operation of the earthing switch when the switch is in the closed position.

The mechanism for the T-off switch should be provide a built in interlocking system to prevent operation of the switch when the earthing switch is closed, and to prevent operation of the earthing switch when the switch is in the closed position. The mechanism for the VCB and the disconnecter-earthing switch should be has a built in interlocking system to prevent operation of the disconnecter-earthing switch when the VCB is in the closed position.

Further is should not be possible to Open the Cable doors unless the Earthing Switch is Turned ON. In case the Cable door is accidentally left open a positive interlock shall prevent operation of Load Break Switch and Isolators / Breaker from any operation.

12.11 Current Transformers

All current transformers should be complying with IEC 60185.

Current transformers should be of dry type, with ratings and ratios as required. Cable current transformers used in circuit breaker modules should be maximum 100mm wide. Current transformers used in metering cubicles should be having dimensions according to DIN 42600, Narrow type. Current transformer shall be placed in the cable covers so that it can be easily replaced at site without removing the bushings.

12.12 Auxiliaries.

The switchgear should be prepared for options like motor operation, auxiliary contacts and short-circuit indicators. Necessary terminal blocks and wiring etc. should be placed behind the front cover of each modules

13.0 TESTING AND CERTIFICATION.

13.1 TYPE TESTS.

Units should be type tested in accordance with IEC standards 60056, 60129, 60265,

60298, 60420, 60529 and 60694. The following type tests should perform on the HT Switchgear and report should submit with offer.

- Short time and peak withstand current test
- Temperature rise tests

CSS-11


 19/06/17
 Chief Elec. Engineer (Switchgear)


 19/06/17

(31-12)

- Dielectric tests
- Test of apparatus i.e. circuit breaker and earthing switch
- Arc fault test
- Measurement of resistance of main circuit.
- Mechanical endurance test.
- Duty cycle test.
- Internal arc test for HT chamber.
- Type test reports for above type shall be submitted with the offer.

13.2 ROUTINE TESTS.

Routine tests should be carried out in accordance with IEC 60298 standards. These tests should ensure the reliability of the unit.

Below listed test should be performed as routine tests before the delivery of units;

- Withstand voltage at power frequency
- Measurement of the resistance of the main circuit
- Withstand voltage on the auxiliary circuits
- Operation of functional locks, interlocks, signalling devices and auxiliary devices
- Suitability and correct operation of protections, control instruments and electrical connections of the circuit breaker operating mechanism
- Verification of wiring
- Visual inspection
- Time travel characteristics measurement facility for Breaker should be available with the manufacturer to assess the quality of RMU.

13.3 Protection Relay

The relay should be flush mounted, Numerical based, 03-over current+01-earth fault feeder protection Relay, providing over current (Low set: 10%-250%), Earth Fault (low set:10%-200%/High set:50%-1250%), Three Phase inrush detection, circuit breaker control, trip circuit supervision, three phase and residual current measurement, non-volatile memory for 100-event log, five fault-record with time stamp, local HMI and user programmable 4DI/6DO for future development of inter locking /changeover scheme. Relay should be communicable on MODBUS protocol.

Distribution Transformer**14.0 Oil filled Transformer :**

CSS-12

[Signature]
19/06/17
on the basis of the information provided

[Signature]
19/06/17
S.P

(31-5)

14.1.1 Requirement: 11000/433 Volt Oil immersed hermetically sealed, corrugated tank and without conservator type design ONAN cooled suitable for installation at outdoor in Enclosure for ground mounting.

14.1.2 Voltage Ratio: No load voltage 11000/433 volts within tolerance as stipulated in IEC 76.

14.1.3 Rating: The transformer shall have a continuous rating as specified at any of the specified tapping position and with the maximum temperature rise specified.

14.1.4 Temperature Rise: The maximum temperature rise at the specified maximum continuous output shall not exceed 40°C by thermometer in the hottest portion of the oil or 50°C measured by resistance of winding above ambient temperature, not exceeding 40°C daily average or 50°C maximum.

14.1.5 Connections: H.V. Delta and L.V. Star connected with neutral brought out on the secondary side for connection to earth; Vector group DYn11.

14.1.6 Tapping :

Each transformer shall be provided with sliding/rotary type tap switch so as to provided for a voltage adjustment on H.V. from +5% to -5% of rated voltage of 11000 volts in 4 equal steps (5 position) to obtain rated voltage of 433 volts on LV side. Refer clause no:4.5.4 for details of rotary switch. The tapping shall be provided for following voltage ratios at no load.

14.2.1 Cleaning & Painting :

- a) All steel surfaces shall be thoroughly cleaned by sand blasting or chemical agents, as required to produce a smooth surface free of scales, grease and rust.
- b) The internal surfaces in contact with insulating oil shall be painted with heat resistant insulation paint which shall not react & be soluble in the insulating liquid used.
- c) The external Surfaces, after cleaning, shall be given two coats of high quality epoxy based rust resisting primer followed by filler coats.
- d) The transformer shall be furnished with coats of weather resisting battleship gray epoxy based enamel paint specially recommended for transformer use.
- e) The paints shall be carefully selected to withstand tropical heat rain, effect of proximity to the sea etc. The paint shall not scale off or crinkle or be removed by abrasion due to normal handling.
- f) Special care shall be taken by the manufacturer to ensure against rusting of nuts, bolts and fittings during operation. All bushings and current carrying parts shall be cleaned properly after final painting.

14.2.2 Both H.V. and L.V. bushings shall have creepage corresponding to very heavily Polluted atmosphere.

14.2.3 Oil: New transformer oil used shall be according to relevant IEC standards

CSS-13


19/06/17
19/6/17

31-I

14.2.4 Phase Marking & Danger Plate: Phase markings in fluorescent paint on small non-corrodible metallic tags shall be permanently fixed for H.V. and L.V. sides. Phase markings tags shall be properly fixed with proper alignment. Danger plates shall be provided on the H.V & LV sides, mentioning the Corresponding Voltages.

14.3 Core and Coil :

14.3.1 Core : The core shall be constructed from high grade, cold rolled, non-ageing, low loss, high permeability, grain oriented, cold-rolled grain oriented silicon steel laminations. The transformer shall be so designed as to have minimum humming noise. The percentage harmonic potentials with the maximum flux density under any conditions shall be such that capacitors connected in the system shall not be overloaded.

14.3.2 The core and coil assembly shall be securely fixed in position so that no shifting or deformation occurs during movement of transformer. The core and coil assembly shall be capable of withstanding without injury, the thermal and mechanical effects of short circuit at the terminals of any winding.

14.3.3 Noise: The Contractor shall take special precautions to ensure that the noise and vibration level does not exceed which is obtained in good modern practice.

14.3.4 Percentage Impedance: The Percentage impedance value at 75 Deg. C at any tap shall be as per IS/ IEC subject to tolerance as specified in relevant IEC standards. ie. 4.5% upto 630kVA and 5% upto 1250kVA the value of the impedance volts at each tapping over the specified range shall be specified in the bid.

14.3.5 Regulation: The regulation at 75° C at full load at unity and 0.8 power factor subject to the usual tolerance as per IEC standards shall be specified in the bid.

14.3.6 Power Freq. High Voltage & Insulation Level (Impulse voltage): The distribution transformer shall be designed so that they are capable of withstanding high voltage & impulse voltages as given below:

a) Impulse Voltage for 11kV winding: 75 kV (1.2/50 Microsecond wave shape).

b) High Voltage: 28kV rms.

14.4.0 RATINGS (Summary) :

	Application	Dist. Tfr. With Corrugated Tank
4.4.1	Service	Outdoor in an Enclosure, Step down.
4.4.2	Type	Oil immersed corrugated tank
4.4.4	No. of Phases	3
4.4.5	No. of winding per phase.	2
4.4.6	Rated output (MVA) with ANAN cooling	HV/LV
4.4.7	Rated Voltage in KV (Line to line).	HV-11KV. LV-0.433V

CSS-14

[Signature]
19/10/17

[Signature]
19/10/17

4.4.8	Rated Frequency	50 Hz
4.4.9	Temperature rise: The temperature rise over ambient shall not exceed the limits given below	
A.	Top oil temperature rise measured by thermometer	35°C
B.	Winding temperature rise measured by resistance method	40°C
4.4.10	Guaranteed loss at 75°C and at normal tap position without any positive tolerance.	
A.	No Load Loss (W).	As per IS.1180:2014 or latest
B.	Full Load Loss (W).	As per IS.1180:2014 or latest
C.	Total Loss	As per IS.1180:2014 or latest
4.4.11	Insulation Level	
A.	HV Power Frequency KV rms.	28 KV.
B.	HV (KV peak) Impulse.	75KV.
C.	LV (KV).	-
4.4.12	Vector Group	Dyn11
4.4.13	Parallel Operation	Yes
4.4.14	Types of Tap Provided.	Off Load Full Capacity.
A.	Tap provided on	OFF load full capacity
B.	Range of Taps	±5% in step of 2.5% (4 steps, 5 position).
C.	Method of Tap Change Control	Rotary Switch /sliding Switch
D.	Manual Load	Yes 'Off Circuit'
4.4.15	Percentage impedance at 75°C	As per IS.
4.4.16	System Earthing	
A.	HV	Solidly earthed.
B.	LV	Solidly earthed.
C.	LV Neutral	Solidly earthed.
4.4.18	Transformer -bushing Voltage Clas (a.) HV Side (b.) LV Side	12 KV Class. 1.1 KV Class.
4.4.19	System fault level (a.) HV Side (b.) LV Side	500 MVA (11KV) -
4.4.20	Short Circuit Withstand capability duration	3 Sec.
4.4.21	LT Side CT Ratings	
A	Current ratio	As per Applicable.
B	Class of Accuracy	1.0
C	Burden	5VA
D	Type	Resin Cast ring type

14.5.0 Fittings & Accessories For Corrugated Tank Transformer :

CSS-15

[Signature]
10/6/17

[Signature]
10/6/17

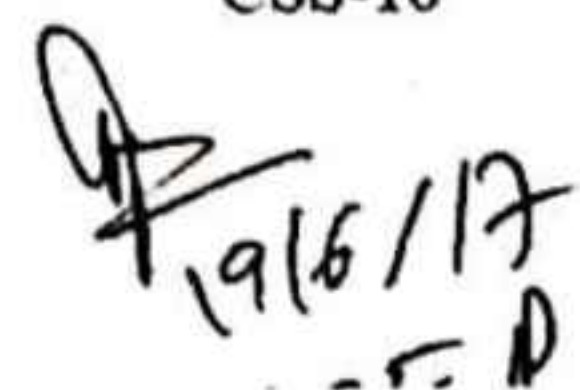
- 14.5.1 The following accessories shall be provided for 11 kV/0.433 kV, distribution transformer.
- 14.5.2 Two earthing terminals with copper lugs. The lugs shall be provided in such a way that they shall not obstruct the movements of rollers. The earthing continuity for all the connected equipments shall be properly done.
- 14.5.3 Two lifting lugs for complete transformer as well as enclosure.
- 14.5.4 Off circuit tapping switch shall be rotary/sliding type, 3 pole gang operated, top mounting fixed out type only. Tap switch shall be suitable for operating voltage of 11kV and above and shall have rated current of 16.53A/26.54A/39.64Amps. Switch shall be provided with externally operating hand wheel handle with indicator and locking device, with direction changing facility and locking arrangement. Bidders shall submit with the bid, technical catalogue for the off load tap switch for Purchaser's approval.
- 14.5.5 Rating plate and diagram plate of durable non-corroding metal giving information as required under IEC 76. Rating plate shall also include Transformer Actual %Z, No-Load Loss & Full-Load Loss at 75°C along with details like Purchase Order Number, date. The name plate marking shall be done with fluorescent colour. Each equipment shall carry individual name-plate with proper instructions & affixed with screws.
- 14.5.6 Four plain rollers fitting so that the transformer can suitably moved in any direction along
With roller direction changing and locking facility shall be provided.
- 14.5.7 Skid with Haulage lugs.
- 14.5.8 Instructions & affixed with screws.
- 14.5.9 Skid with Haulage lugs.

15.0 CAST RESIN DRY TYPE TRANSFORMER

The make of the dry type transformer shall be the same as the make of compact substation manufacturer. This specification covers the requirements of design, manufacture, testing and supply of cast resin dry type transformers complete with all the accessories and fittings for efficient and trouble-free operation.

a. CODES & STANDARDS

CSS-16



(31-F)

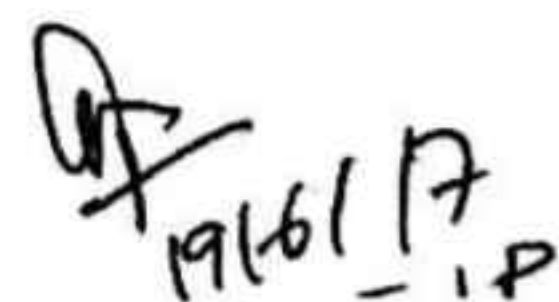
- i. The equipment covered by this specification shall, unless Other wise stated to be designed, constructed and tested in accordance with latest revisions of relevant Indian standards / IEC publications.

IS 1271	-	Classification of Insulating Materials.
IS 2026	-	Power transformers (part I - V)
IS 2099	-	Bushing for alternating voltages above 1000 V
IS 2705	-	Current transformers
IS 3202	-	Code of practice for climate proofing
IS 3639	-	Power transformer fittings and accessories
IS 4257	-	Porcelain bushings for transformers
IS 11171	-	Dry type Transformer
IS 8478	-	Application guide for tap-changers
IS 10028	-	Code of practice for selection, installation and maintenance of transformers.

b. GENERAL DESIGN FEATURES

- i. All transformers shall be of the latest design, dry type Cast Resin only.
- ii. The type of cooling shall be Natural Air cooled (AN) and the corresponding ratings for each transformer shall be as indicated in the specific requirements.
- iii. Each transformer shall be suitable for operation at full rated power on all tapings without exceeding the applicable temperature rise.
- iv. It shall be possible to operate the transformer satisfactorily, with the loading guide specified in IS-6600. There shall be no limitations imposed by bushings, tap changers auxiliary equipment to meet this requirement.
- v. The transformers shall be designed to be capable of with-standing, without injury, the thermal and mechanical effects of short-circuits between phases or between phase and earth at the terminals of any winding with full voltage applied across the other winding for periods given in relevant standards. There shall be no limitations imposed by any part/component of the transformer/off load tap links to meet the short circuit level Specified.
- vi. Each transformer shall be designed for minimum no-load and load losses within the economic limit and shall be able to have minimum loss at the rated load condition.
- vii. All electrical connections and contacts shall be of ample cross sections for carrying the rated current without excessive heating.
- viii. The transformer shall be capable of continuous operation at full load rating under the following conditions.
 1. Voltage variation = $\pm 10\%$
 2. Frequency variation = $\pm 5\%$

CSS-17



(31-E)

3. Combined voltage and frequency variation (Absolute sum) = 10%

c. CONSTRUCTION

- i. The transformer shall be dry type, AN cooled suitable for Compact substation application.
- ii. The core-clamping frame shall be provided with lifting eyes having ample strength to lift the complete core and winding assembly.
- iii. Off circuit tapings shall be provided on the HV windings. Tap changing is done by means of off-circuit links accessible through openings provided.
- iv. The lifting lugs and rollers shall be provided. A winding temp. Scanner shall be provided and is actuated by means of resistance temperature detectors embedded in LV windings of all three phases. It should have alarm and trip contacts at a specified temperature.
- v. The transformer shall be of IP00 protection class and will be installed in the transformer compartment of compact substation having IP23 protection class.

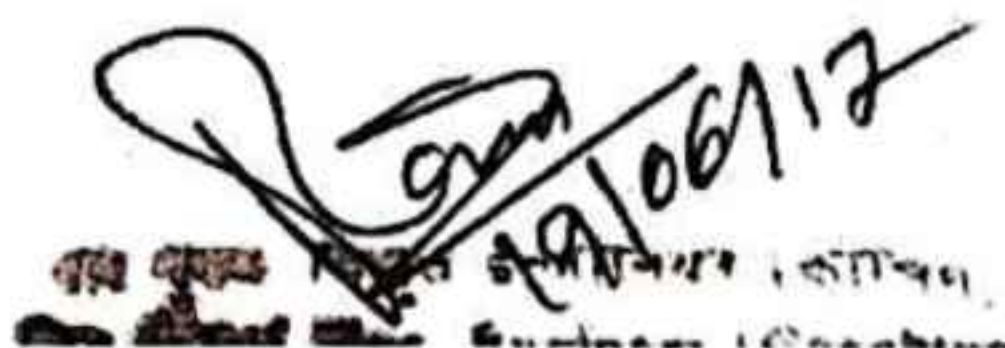
d. WINDINGS

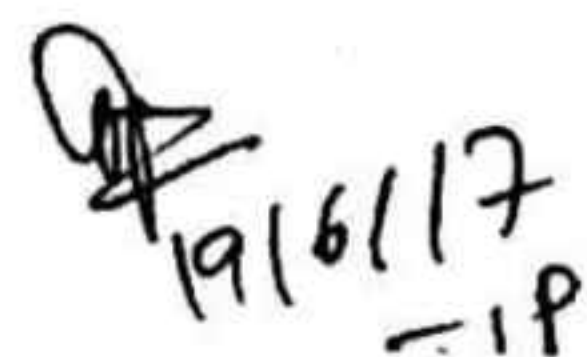
- i. The winding insulation shall be of Class 'H' and temperature rise limit to Class H. i.e. 115 deg. C
- ii. Windings shall be of electrolytic copper or aluminum conductors of high conductivity purity.
- iii. Windings shall be designed to withstand the specified thermal and dynamic short circuit stresses.
- iv. The windings shall be duly sectionalised. Accessible joints brazed or welded and finished smooth shall connect similar sections. No corona discharge shall result on the winding upon testing the transformer for induced voltage test as specified in IS.
- v. The end turns of the high voltage windings shall have reinforced insulation to take care of the voltage surges likely to occur during switching or any other abnormal condition.
- vi. The high voltage and low voltage winding are shall be made of copper Conductors. HV winding will be always be resin casted under vacuum while LV winding can either be casted or pre-impregnated with resin.

e. CORE

- i. The double wound Core shall be constructed from non-ageing cold rolled Grain oriented steel sheets. The built core shall be painted with high temperature resistant paint to prevent corrosion at the edges of core plates and to withstand high temperatures. By using different core material optimisation of core losses shall be achieved. The yokes shall be firmly clamped between yoke channels or

CSS-18


19/06/17


19/6/17
-18

31-D

- plates. The top & bottom yoke frames shall be secured to each other by means of tie-rods, which help in securing the winding in place.
- ii. The design of the magnetic circuit shall be such as to avoid static discharges, development of short circuit paths within itself or to the earthed clamping structure and the production of flux component at right angles to the planes of laminations which may cause local heating.
- f. **OFF-CIRCUIT TAP CHANGING LINKS**
- i. Off circuit tapings are provided on HV windings. Tap changing is done by means off circuit links. Use of tap changing links eliminates any moving parts as against a manually operated tap changer.
- g. **Terminal Arrangement**
- i. HV side and LV side of transformer will have the top busbar arrangement for connection of HT side by means of cable and LT side by means of busbar.
- h. **Technical particulars of dry type transformer**

SR. NO.	DESCRIPTION	PARTICULARS
01	Type	Three Phase, 50 Hz, Core type, two winding, Cast Resin Dry type Transformer
	Make of transformer	Same as the make of compact substation
02	Rating (KVA)	As per BoQ
03	Winding material	Copper / Aluminum
04	No load voltage ratio	11 / 0.433
05	Connection a) HV b) LV	Delta Star with neutral
06	Vector group	Dyn 11
07	Insulation level (KVp/ KVrms) a) HV b) LV	75 / 28 - / 03
09	Type of Tap Changer for giving voltage variation to HV	Off ckt tap links
10	Tapping range	+5 % to -5 % in step of 2.5%
11	Temperature rise winding over ambient temperature	115 °C
12	Class of Insulation	Class 'H'
13	Enclosure	IP 00 (Without Enclosure)
14	Method of Cooling	AN (Air Natural)

CSS-19

[Signature]
19/06/17

[Signature]
19/06/17
- C.E.P

15	No load losses at rated voltage & frequency (IS Tol.)	As per BoQ
16	Full load loss at principle tap at 75 ° C (IS Tol.)	As per BoQ
17	Termination HV LV	Busbar Busbar
18	Fittings for Dry type	2 Numbers Earthing Terminals, Rating and Diagram Plate, Bi-Directional Rollers, Lifting Lugs, Winding Temp Scanner.

i. PAINTING

- i. All steel surfaces shall be thoroughly cleaned by sand blasting or chemical agents as required to produce a smooth surface free of scale, grease and rust. The external surface, after cleaning, shall be given a coat of high quality red oxide or yellow quoted primer, followed by filler coats.

j. Routine Test

- i. All Routine Tests in accordance with IEC 60076 / IS 2026 shall be carried out on each transformer.

LT Panel

16.0 System :

(a.) Declare Voltage: 3 Phase, 400V ($\pm 6\%$) 50 Hz

(b.) Neutral: Solidly earthed at substation.

16.1 General Finish: Tropical, totally enclosed, metal-clad, weather-proof, vermin and dust proof.

16.2 LT Switchgears: the low voltage switchgears should comply to the following relevant standards.

Sl. No.	Item	Relevant IS/IEC
1	Low voltage switch gear and controlgear assemblies pt-1, type tested and partially type tested assemblallies.	IEC-439-1,1992
2	Low voltage switchgear and control gear pt,-1 general rules	IEC-947-1,1998
3	High voltage test techniques for low voltage equipment pt - 1 defination test and procedure requirement.	IEC-1180-1,1992

CSS-20

[Handwritten signature]
20/11/17

[Handwritten signature]
19/6/17
IP

31-B

4	Degree of protection provided by enclosures	IEC-529,1989
5	ACB(Air Circuit Breaker)	Confirm
6	MCCB	to IEC60947/IS13947 Pt-2:1993 IS:8028/IEC60947-1,IEC 60947-2,IEC 60947-3

17.0 Construction:

Enclosure: Dead front type of enclosure shall be able to provide the degree of protection IP:4X.

18.0 Circuit Ways:

As per Bill of material enclosed.

19.0 Earthing:

- 19.1 Earthing arrangement shall be provided for earthing each cable, PVC cable gland, neutral busbar, chassis and frame work of the cubical with separate earthing terminals at two ends. The main earthing terminals shall be suitably marked. The earthing terminal shall be of adequate size, protected against corrosion, and readily accessible. These shall be identified by means of sign marked in a legible manner on or adjacent to terminals.
- 19.2 Neutral Busbar strip shall be connected to earthing terminal with help of GI strip of suitable capacity & nut-bolt arrangement.

Type/Routine Test on Package Substation**20.0 Type Test for the package Substation complete Assembled:**

20.1 The Package Substations offered must be type tested as per latest IEC 62271-202 only. The copy of type test summary should be submitted along with the tender. CSS manufactured at in JV consortium shall not be accepted. All type test reports should have 5 years validity from the date of tender opening.

20.2 Routine test The routine tests shall be made on each complete prefabricated substation.

(a.) Voltage tests on auxiliary circuit.

(b.) Functional test.

(c.) Verification of complete wiring.

20.3 Test witness: Routine test shall be performed in presence of Owner's representative if so desired by Owner. The contractor shall give at least fifteen (15) days advance notice of the date when the tests are to be carried out.**20.4 Test Certificates:** Certificate reports of all the tests carried out at the works shall be furnished in three (3) copies for approval of the Owner.**20.5 Performance Certificate to Qualify Technical Bid:****20.6** All the major components of CSS (HT switchgear, Transformer, LT Switchgear and Enclosure) should be of same Make/OEM).**20.7** Contractor should submit 2 years performance for at least 20 Nos. of Compact Sub-station successfully running in India along with the technical credential, from the manufacturer of Compact sub-station quoted.

CSS-21

[Signature]
10/06/17

[Signature]
19/06/17

550103/2022/O/o CECE/HQ/NER

- 20.8 Contractor should submit Type test report of CPRI (India Only) for Fault current rating of at least 20 kA for VCB and IP Type test report for Sub-station Enclosure from CPRI (India only) in the technical offer.
- 20.9 Authorization certificate from the manufacturer shall be required by the contractor to be submitted along with the technical documents for pre-qualification, else the technical offer shall be rejected.
- 21.0 Make of Packaged Sub station
ABB/BHEL/L&T/SCHNEIDER

[Signature]
19/06/17

[Signature] SS-22
19/6/17
SSEIP



पूर्वोत्तर रेलवे

कार्यालय
महाप्रबन्धक/विद्युत
गोरखपुर
दिनांक 26.12.2018

संख्या: L/S/P/CEE's Specification/Pt-IX /4405

वमविड़/लखनऊ, वाराणसी, इज्जतनगर
उपमविड़/कालोनी/गोरखपुर
उपमविड़/कार0/इज्जतनगर, गोरखपुर
उपमविड़/निर्माण/बी.जी./गोरखपुर

विषय: Revised specification for Package type compact substation 11/0.415 KV.

संदर्भ: इस कार्यालय के समसंख्यक पत्र Pt.VIII / 138 दिनांक 19.06.2017 द्वारा जारी स्पेसिफिकेशन संख्या: - CEE / CSS / 17 , June 2017.

इस कार्यालय के सन्दर्भित पत्र के माध्यम से "Package type compact substation 11/0.415 KV" हेतु स्पेसिफिकेशन संख्या- CEE / CSS / 17 , June 2017 पूर्व में जारी किया गया था। उक्त स्पेसिफिकेशन के Clause 21.0 (Make of Packaged Sub station) में निम्नानुसार संशोधन करते हुए CSS (Compact Sub Station) निर्माता कम्पनी C&S का नाम सम्मिलित किया जाता है:-

21.0 Make of Packaged Sub station
ABB/BHEL/L&T/SCHNEIDER/C&S

उपरोक्त पर प्रमुविड़ महोदय का अनुमोदन प्राप्त है।

26/12/18

(पी.के. शर्मा)

सचिव/प्रमुविड़

कृते महाप्रबन्धक/विद्युत

26-12-18
(निष्क/पपर)

I/26650/2022

**CORRIGENDUM****पूर्वोत्तर रेलवे****कार्यालय****प्रमुख मुख्य विद्युत इंजीनियर****पूर्वोत्तर रेलवे/गोरखपुर****दिनांक – 14.06.2022****सं0: L/S/P/PCEE's Specification/Pt-IX/****वमविड़/सा0/लखनऊ, वाराणसी, इज्जतनगर****उपमविड़/निर्माण/बी.जी./गोरखपुर****उपमविड़/कार0/गोरखपुर****उपमविड़/कालोनी/गोरखपुर****मविड़/कार0/इज्जतनगर****विषय:** Revised specification for Package type compact substation 11/0.415 KV.**संदर्भ:** (i) इस कार्यालय का पत्र – L/S/P/PCEE's Specification/Pt.VIII दिनांक 19.06.2017 द्वारा जारी**स्पेसिफिकेशन संख्या:** - CEE/CSS/17, June 2017.

(ii) इस कार्यालय का समसंख्यक पत्र - L/S/P/PCEE's Specification/Pt-IX/ 243 दिनांक 25.10.2021

एवं निल दिनांक 22.11.2021.

इस कार्यालय के संदर्भित पत्र (i) द्वारा "Package type compact substation 11/0.415 KV" के स्पेसिफिकेशन संख्या- CEE/CSS/17, June 2017 पूर्व में जारी किया गया था। उक्त स्पेसिफिकेशन में संदर्भित पत्र (ii) द्वारा संशोधन किया गया था जिसके Clause No. में निम्नलिखित संशोधन किया जाता है -

Existing		Read as		
Clause No.	Description	Clause No.	Description	Revised as
1.0	Scope: This specification covers the design, supply, Testing & commissioning of compact sub-station as integral unit comprising of Oil filled /Dry Type distribution transformer (63 KVA-2000 KVA), HT Panel comprising of 11 KV Non-Ext SF6 Insulated RMU with Vacuum Circuit Breaker as protection, Transformer, Low voltage Switchgear & Earthing along with all other accessories as required (HT switchgear, Transformer, LT Switchgear will be of same OEM).	1.0	Scope: This specification covers the design, supply, Testing & commissioning of compact sub-station as integral unit comprising of Oil filled /Dry Type distribution transformer (63 KVA - 2000 KVA), HT Panel comprising of 11 KV Non-Ext SF6 Insulated RMU with Vacuum Circuit Breaker as protection, Transformer, Low voltage Switchgear & Earthing along with all other accessories as required (HT switchgear, Transformer, LT Switchgear will be of same OEM).	Scope: This specification covers the design, supply, Testing & commissioning of compact sub-station as integral unit comprising of Oil filled / Dry Type distribution transformer (63 KVA - 2000 KVA), HT Panel comprising of 11 KV Vacuum Insulated RMU with Vacuum Circuit Breaker as protection, Transformer, Low voltage Switchgear & Earthing along with all other accessories as required.
24.5	All the major components of CSS (HT switchgear, Transformer, LT Switchgear and Enclosure) should be of same Make /OEM)	20.6	All the major components of CSS (HT switchgear, Transformer, LT Switchgear and Enclosure) should be of same Make /OEM)	Deleted
24.6	Contractor should submit 05 years performance for at least 20 Nos. of Compact Sub-station successfully running in India along with the technical credential, from the manufacturer of Compact Sub-station quoted.	20.7	Contractor should submit 02 years performance for at least 20 Nos. of Compact Sub-station successfully running in India along with the technical credential, from the manufacturer of Compact Sub-station quoted.	Deleted
25.0	Make of Packaged Sub station: ABB/BHEL/L&T/SCHNEIDER /C&S	21.0	Make of Packaged Sub station: ABB/BHEL/L&T/SCHNEIDER /C&S	Deleted

उपरोक्त पर प्रमविड़ महोदय का अनुमोदन प्राप्त है।

(एस0पी0यादव)

Digitally Signed by

कृते प्रमुख मुख्य विद्युत इंजीनियर

Date: 14-06-2022 15:48:42

Reason: Approved

607947/2022/O/o CWM/MWS/GKP/NER

410783/2021/O/o CECE/HQ/NER



पूर्वोत्तर रेलवे

कार्यालय

प्रमुख मुख्य विद्युत इंजीनियर

पूर्वोत्तर रेलवे/गोरखपुर

दिनांक - 22.11.2021

संख्या: L/S/P/PCEE's Specification/Pt-IX/

वमविड़/लखनऊ, वाराणसी, इज्जतनगर

उपमुविड़/निर्माण/बी.जी./गोरखपुर

उपमुविड़/कार0/गोरखपुर

उपमुविड़/कालोनी/गोरखपुर

मविड़/कार0/इज्जतनगर

विषय: Revised specification for Package type compact substation 11/0.415 KV.

संदर्भ: इस कार्यालय के समसंख्यक पत्र संख्या - L/S/P/PCEE's Specification/Pt. IX/243

दिनांक 25.10.2021 एवं स्पेसिफिकेशन संख्या: - CEE/CSS/18 दिनांक 08.08.2018.

इस कार्यालय के सन्दर्भित पत्र के माध्यम से "Package type compact substation 11/0.415 KV" हेतु स्पेसिफिकेशन पूर्व में जारी किया गया था। उक्त स्पेसिफिकेशन में निम्नलिखित संशोधन किया जाता है -

Clause No.	Existing Description	Read as
24.6	Scope: Contractor should submit 5 years performance for at least 20 Nos. of Compact Sub-station successfully running in India along with the technical credential, from the manufacturer of Compact Sub-station quoted.	Deleted

उपरोक्त पर प्रमुविड़ महोदय का अनुमोदन प्राप्त है।

(सौरभ चौधरी)
सचिव/ प्रमुविड़
कृते प्रमुविड़ इंजीनियर

**CORRIGENDUM****पूर्वोत्तर रेलवे****कार्यालय****प्रमुख मुख्य विद्युत इंजीनियर****पूर्वोत्तर रेलवे/गोरखपुर****दिनांक - 19.09.2022****सं०: L/S/P/PCEE's Specification/Pt-IX/804****वमविड़/सा०/लखनऊ, वाराणसी, इज्जतनगर****उपमविड़/निर्माण/बी.जी./गोरखपुर****उपमविड़/कार०/गोरखपुर****उपमविड़/कालोनी/गोरखपुर****मविड़/कार०/इज्जतनगर****विषय: Revised specification for Package type compact substation 11/0.415 KV.****संदर्भ: (i) इस कार्यालय का पत्र - L/S/P/PCEE's Specification Pt. VIII /138 dt. 19.06.2017****द्वारा जारी स्पेसिफिकेशन संख्या: - CEE / CSS /17, June 2017.****(ii) इस कार्यालय का समसंख्यक पत्र - L/S/P/PCEE's Specification/Pt-IX/243****dt. 25.10.2021, Nil dt. 22.11.2021 एवं I/26650/2022 dt. 14.06.2022.**

इस कार्यालय के संदर्भित पत्र (i) द्वारा "Package type compact substation 11/0.415 KV" के स्पेसिफिकेशन संख्या- CEE / CSS / 17 , June 2017 पूर्व में जारी किया गया था। उक्त स्पेसिफिकेशन में संदर्भित पत्र (ii) द्वारा संशोधन किया गया था जिसमें पुनः निम्नलिखित संशोधन किया जाता है -

Clause No.	Existing Description	Revised Description
1.0	Scope: This specification covers the design, supply, Testing & commissioning of compact sub-station as integral unit comprising of Oil filled / Dry Type distribution transformer (63 KVA - 2000 KVA), HT Panel comprising of 11 KV Vacuum Insulated RMU with Vacuum Circuit Breaker as protection, Transformer, Low voltage Switchgear & Earthing along with all other accessories as required.	Scope: This specification covers the design, supply, Testing & commissioning of compact sub-station as integral unit comprising of Oil filled /Dry Type distribution transformer (63 KVA-2000 KVA), HT Panel comprising of 11 KV Non-Ext SF6 Insulated RMU/Vacuum Insulated RMU/ Solid Insulated Vacuum Interrupted RMU with Vacuum Circuit Breaker as protection, Transformer, Low voltage Switchgear & Earthing along with all other accessories as required.

"However, Field units are advised to explore the possibility of best available RMU and VCB in market (in all respect considering operation, safety and cost etc.)."

Above specification is only for guidance. Hence, field units may adopt best practices available in other Railway units.

This issues with the approval of PCEE.

(एस०पी०यादव)

सचिव/प्रमविड़

कृते प्रमुख मुख्य विद्युत इंजीनियर

सं0: L/S/P/PCEE's Specification/Pt-IX/ 577 (e.o.-50629)

दिनांक - 18.08.2023

वमविड़/सा0/लखनऊ, वाराणसी, इज्जतनगर

उपमविड़/निर्माण/बी.जी./गोरखपुर, लखनऊ

उपमविड़/कार0/गोरखपुर

मविड़/कार0/इज्जतनगर

मविड़/कालोनी/गोरखपुर

विषय: Revised specification for Package type compact substation 11/0.415 KV.

संदर्भ: इस कार्यालय के समसंख्यक पत्र संख्या - L/S/P/PCEE's Specification/Pt. IX/804 दिनांक 19.09.2022 एवं स्पेसिफिकेशन संख्या: - CEE/CSS/18 दिनांक 08.08.2018.

इस कार्यालय के सन्दर्भित पत्र के माध्यम से "Package type compact substation 11/0.415 KV" हेतु Technical Specification पूर्व में जारी किया गया था। उक्त Specification में निम्नलिखित संशोधन किया जाता है -

Clause No.	Existing Description	Read as
20.1	<p>Type/Routine Test on Package Substation</p> <p>The Package Substations offered must be type tested as per latest IEC 62271- 202 only. The copy of type test summary should be submitted along with the tender.CSS manufactured at in JV consortium shall not be accepted.</p> <p>All type test reports should have 05 years validity from the date of tender opening.</p>	<p>Type/Routine Test on Package Substation</p> <p>The Package Substations offered must be type tested as per latest IEC 62271- 202 only. The copy of type test summary should be submitted along with the tender.CSS manufactured at in JV consortium shall not be accepted.</p> <p>All type test reports should have 10 years validity from the date of tender opening or is valid as long as there is no revision either in the product design or in the relevant national/ international standards, whichever is latest.</p>

उपरोक्त पर प्रमुविड़ महोदय का अनुमोदन प्राप्त है।

(एस0पी0यादव)

सचिव/प्रमुविड़

कृते प्रमुख मुख्य विद्युत इंजीनियर