

Date: 17/02/2021

Reference: DCRP/PA/2021/009

Circular

To whom it may concern

After Compliments,

Subject: DCRP Approval for Package Substation of Metal Enclosure

With reference to DCRP Meeting Q4/2020.

DCRP would like to inform you that the above-mentioned product package substation of metal enclosure, shall be evaluated & approved by DCRP by complying to OES11 & relative IEC Standards prior to installation in the network.

Hence, all concern manufacturers and suppliers are encouraged to:

1. Design, manufacturer, and type test the product according to the latest version of IEC standards, taking into consideration the requirements listed in the attached Technical Checklist. **Complete Type Test Certificate**, from third party accredited laboratory (STL Member, and accepted by DCRP) shall be submitted.
2. Submit Complete pre-qualification file for package substation Class A product as per product approval procedure.

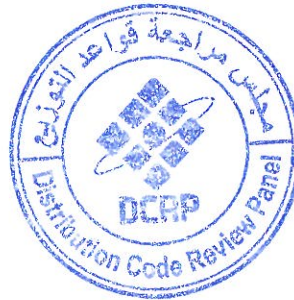
For your kind attention & action.

Yours faithfully,



Mohammed Abdullah Al Abri

DCRP Sr. Manager



CC:

- Product Approval Section Head-DCRP
- File



Technical Checklist for Package Substation

Product Details	
Manufacturer:	
Agent:	
Date of submission	

No	Category/Items	Requirements	Manufacturer Submission	Compliance
1	Standards	OES-11 & IEC 62271-202 Latest version & Relative IEC standards		
2- Service & System Conditions				
2.1	Indoor/Outdoor installation	Outdoor		
2.2	Min Ambient Temp (°C)	5		
2.3	Max. Ambient Temp (°C)	50		
2.4	Maximum temperature of metal surface in direct sunlight	80		
2.5	Max. Humidity (%)	100%		
2.6	Altitude (m)	sea level - 30 m trs		
2.7	Maximum Wind Velocity	125 Km/hr.		
2.8	Rated maximum power of the prefabricated transformer (KVA)	500 KVA or 1000 KVA		
2.9	Vibration (Class)			
2.10	Solar radiation W/m2			
2.11	Pollution level			
2.12	Average annual rainfall	100 mm		
2.13	Rated Service Voltage (KV)	11 KV		
2.14	Rated Low Voltage (KV)	0.433 KV		
2.15	Rated voltage for windings of the transformer (KV)	11/0.433 KV		
2.16	Rated frequency (Hz)	50 Hz		
2.17	Temp. Class (K)	class 5		



2.18	Design fault level	<p>For HV: 18.4 KA/1s (Rated Current 400A @ 50 C)</p> <p>For LV: 46 KA/0.5s</p>		
2.19	Internal Arc Classification	PSS shall be of class AB for type test purpose, IAC-B shall be performed		
3-Design & Constructions				
3.1	Type	Prefabricated substations (PSS) shall be designed so that normal service, inspection and maintenance can be carried out safely. Additionally, the substation shall be designed and constructed in such a manner that the risk of unauthorized access is minimized. Attention shall be paid to hinges, vent covers, locking mechanisms, etc. (Hinges and all other fasteners should be SS316 L)		
3.2	Substation Operation Type	Operated from Outside		
3.3	Connection	<p>HV side: 1C 120 mm² Cables Connection XLPE insulated cable at the transformer side and termination at the Ring Main Unit side. Cable Support shall be provided</p> <p>LV side: Busbar connection</p>		
3.4	Complete PSS	Each substation shall contain three main equipment: Transformer, Ring Main Unit and Feeder Pillar all are contained in a housing which is accessible by doors from each side.		



3.5	Degree of Protection	For RMU compartment – IP43 For Transformer compartment - IP23 For LVDB compartment – IP23 Complete PSS - IP 23D		
3.6	Mechanical Impact Energy	IK10 with Energy 20J on covers, doors and ventilation openings.		
3.7	Mechanical Stress (N/m²)	Roof Load: Wind Pressure: shall be verified by calculation		
3.8	Enclosure construction Data	<p>Enclosure Material: Metal Hot Dip Galvanized (iron and steel with zinc)</p> <ul style="list-style-type: none"> ▪ Base frame Minimum thickness: 3 mm ▪ Corner posts Minimum thickness: 3 mm ▪ Walls Minimum thickness 2 mm Base Frame Channel shall be provided ▪ Roof (Three removable Roof Parts of double layers with half canopy) - Minimum thickness: 2 mm - Roofs shall be waterproof. - The bottom side of all around the roof frames and the roof bottom layer inside the housing has sufficient pre-punch slots. ▪ Doors (4 doors Double type) Minimum thickness 2 mm Locking system: heavy-duty locking bar and L- welded stainless steel Provided with stopper 120 and 180 degrees 		

		<p>and padlock facility with handle</p> <ul style="list-style-type: none"> ▪ Ventilation <ul style="list-style-type: none"> - Louver shall be built-in with IP 23D - Ventilation apertures shall be equipped with sand traps to prevent sands accumulation inside the housing ▪ Explosive disruption Pressure relief: Required 		
3.9	Enclosure Painting & Finishing	<p>Class C3 OR C5 for very humid corrosive environment</p> <p>RAL 7035</p>		
3.10	Overall Dimension [HxWxD] mm	<p>Height:2500 Width:2400 Length: 3500</p>		
3.11	Sound Leve(dB)	64 dB		
3.12	Earthing	<p>HV Side: Material: Copper bar Width: 25 mm Thickness: 3mm</p> <p>LV Side : Material: PVC Covered Copper wire Cross section: 120 sq.mm</p>		
3.13	Earth Bonding	<p>Bonding between Neutral bus and LV earthing pit material: PVC Covered Copper wire cross-section: 120 sq.mm</p> <p>Bonding between equipment and HV earthing bus material: PVC Covered Copper wire cross-section: 2X70 sq.mm</p> <p>Number of connections for external earthing copper rods at housing: 2 nos.</p> <p>Bonding between HV earthing bus and HV earthing pit material: PVC Covered Copper wire cross-section: 120 sq.mm</p>		



3.14	Labelling	<p>Name plate shall contain at least the following information with black filled letters</p> <ul style="list-style-type: none"> – manufacturer’s name or trade mark; – type designation; – internal arc designation, where applicable; – serial number; – instruction book reference; – number of standard; – year of manufacture. <p>Danger plate for HV & LV shall be provided</p> <p>Red light reflector provision</p> <p>Label should have the overall specification of the Package SS (i.e. RMU, Transformer, FP spec)</p> <p>Lifting instructions</p>		
3.15	Installation & Operation Manual	Required		
4- Product Type Testing Requirements				
4.1	Laboratory Details	<p>Laboratory Name</p> <p>Accreditation Body</p> <p>ISO 17025 Certificate & accreditation Scope shall be attached</p>		
4.2	Type Test Certificate	Required		
4.3	Type Tests (IEC 62271-202)	<p>Type tests shall be made on a representative configuration of the components of a complete prefabricated substation. Components contained in a prefabricated substation shall be tested according to the relevant standards</p>		



		Dielectric Tests		
		Temperature rise test @ 50°C		
		Short time withstand current & peak withstand current tests		
		Tests to verify degree of protection of enclosures		
		Internal Arc Test		
		Mechanical stress withstand test.		
		Electromagnetic compatibility tests (EMC)		
		tests on auxiliary and control circuits		
		Sound Level (special test)		
4.4	Drawings	Single Line Diagram		
		General Assembly & Layout of the Panels		
		Foundation Drawings		
		Circuit Diagram of controls & Protection		
		Bill of Materials		
5- Major Parts of PSS				
5.1 11/0.433 KV Transformer shall be approved make by DCRP				
5.1.1	Manufacturer			
5.1.2	Type	liquid-filled Type transformers		
5.1.3	Ratings/capacity			
5.1.4	General	The transformer shall be located in the middle of the substation while the Ring Main Unit and Feeder Pillar are located at both ends of the substation adjacent to the corresponding bushing of the transformer. This will allow access to Ring Main Unit from one side and Feeder Pillar from opposite side		
5.1.5	Name plate	Shall be provided as per DCRP requirements		



5.2 11KV Ring Main Unit shall be approved make by DCRP				
5.2.1	Manufacturer			
5.2.2	Type	SF6 extendable type		
5.2.3	Model			
5.2.4	General	The Ring Main Unit shall be linked with the transformer using single core 120sq.mm XLPE insulated cable with at the transformer side and termination at the Ring Main Unit side.		
5.2.5	Name plate	Shall be provided as per DCRP requirements		
5.3 LV Feeder Pillar shall be approved make by DCRP				
5.3.1	Manufacturer			
5.3.2	Type/Model			
5.3.3	Rated Current (A)			
5.3.4	General	<p>These feeder pillars shall be connected with transformer with a fully insulated busbar of suitable size to withstand the full rating current 1600 A @ 50 C.</p> <p>The Feeder Pillar shall have an emergency cable entry to connect generator. For this purpose the feeder pillar busbar shall be extended to allow easy connection & installation of generator cables</p>		
5.3.5	Name plate	Shall be provided as per DCRP requirements		



5.4 Auxiliary equipment and circuits				
5.4.1	Mobile Generator Cables	Opening of 250mmX250mm size		
5.4.2	Lighting Door limit switch	No of Lights 4 fitted inside housing Required		
5.4.3	Sockets Single phase	1 fitted inside housing		
5.4.4	Temperature control analogue thermometer	1 fitted inside housing		

Manufacturer Authorized person name:

Signature:

Manufacturer Seal: