

**Minutes of meeting held on 09.10.18 in chairmanship of Director (Op) & Director (Tech), RVPN regarding joint study for transmission system of western Rajasthan (Rajasthan Solar energy zones- Bhadla/Fatehgarh/Bikaner)**

A meeting was held in chairmanship of Director (Op) & Director (Tech), RVPN regarding joint study for transmission system of western Rajasthan (Rajasthan Solar energy zones- Bhadla/Fatehgarh/Bikaner) on 09/10/18 in RVPN office Jaipur. List of participants is enclosed at Annex-I

- 1) In line with the discussion held in 1<sup>st</sup> SCT of NR held on 11.09.18 regarding transmission system for Rajasthan Solar energy zones in Western Rajasthan (scheme details enclosed at Annex-II), a meeting was held on 20.09.18 in Gurgaon with HVPNL, NRPC, RVPN, CEA & CTU. In the meeting RVPN & HVPN suggested network modifications. Incorporating these suggestions, revised studies were carried out for various scenarios like off peak, Solar maximized/minimised, peak demand for the proposed transmission scheme. It was also decided that scheme may be prioritised out of Phase -1 Rajasthan SEZ capacity (10 GW) in accordance to the Stage-II/LTA applications as well as some part of future potential.

The above studies were presented and discussed in the meeting held on 09.10.18 in RVPN office.

- 2) RRVPN stated that interconnection of the proposed RE corridor with RVPN Intra state system and incidental power flow due to these interconnections may also be studied.

Further, RVPN suggested that reactive power management requirement may also be studied for Low RE & Low demand scenario where high voltage is being experienced in RVPN Intra state transmission.

- 3) CEA/CTU stated that RE ISTS has been proposed considering 80-90% line reactive compensation as well as additional Bus reactive compensation. Accordingly, a low demand/Low RE scenario was also studied taking additional Bus reactors/line reactors (Bhadla-2, fatehgarh-2 & Khetri SS) wherein it was observed that the voltage profile of ISTS proposed is within permissible limits and it was even supporting voltage profile to Intra state system in western Rajasthan.

It was also seen that in such scenario the high voltage was observed in the intra-state transmission system of RVPN. It is requested by RVPN that CEA should study the reactive compensation requirement in incidental RVPN system to maintain the voltage profile. It is also intimated that RVPN has already submitted the reactive compensation requirements under various renewable energy injection scenarios to CEA for taking up in NR standing committee in June, 2018 for funding of PSDF. CEA agreed to look in to this aspect.

- 4) After deliberation, with above, proposed system (scheme details enclosed at Annex-III) was technically agreed for evacuation of power from applications for Stage-II/LTA in Phalodi/Bhadla, Fatehgarh & Bikaner complex as well as some part of future potential in above complexes of western Rajasthan.

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Gupta  
9/10/18

Dir (Op), RVPN

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Dir (Tech)

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Dir (Tech) RVPN

It was also decided that scheme for Ramgarh/Kuchcheri in Jaisalmer & additional potential of Rajasthan SEZ may be taken up subsequently based on stage-II connectivity/LTA application.

Annex-I

RVPN

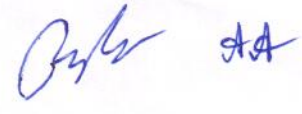
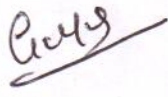
1. Sh. V K Mishra Director (OP)
2. Sh. Kamal Jain Director (Tech)
3. Sh. R KJain CE (PPD)
4. Sh. S C Sharma SE (P&P)
5. Smt Anjana Agwarwal, XEN (PSS)
6. Sh V A Kale , XEN (Automation)
- 7.

CEA

1. Sh. Ravinder Gupta , CE (SP&PA-1)
2. Sh. Awadhesh Kr. Yadav, Director

POWERGRID

1. Sh. KashishBhambhani, Chief Manager
2. Sh. Sandeep Kumawat



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Annex-II

Part A: Transmission system for evacuation of power from Fatehgarh (4 GW), Phalodi/Bhadla (3 GW), Bikaner (1.85GW)

- i) Establishment of 765/400/220kV, 3x1500MVA, 5x500 MVA pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-2)
- ii) Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri
- iii) Augmentation of transformation capacity at Bhadla (PG) by 2x500MVA (6th/7th), 400/220kV transformers
- iv) Transformation capacity at Bikaner (PG) with 2x500MVA, 400/220kV transformers
- v) LILO of 765kV Ajmer – Bikaner D/c line (both ckts) at suitable point with interconnection of suitable point to Bhadla-2-135km
- vi) Bhadla-2 –Bhadla (PG) 400kV D/c Line (Twin HTLS) -30 km
- vii) Bikaner(PG) – Khetri S/s 765kV D/c line -220 km
- viii) LILO of both ckts of 765kV Phagi – Bhiwani D/c line at Khetri S/s- 10 km
- ix) Khetri – Sikar (PG) D/c line (twin HTLS) – 70 km
- x) Augmentation of 1x1500MVA,765/400kV transformer (3rd) at Moga S/s
- xi) Augmentation of 1x1000MVA,765/400kV transformer (3rd) at Bhiwani (PG)
- xii) Establishment of Transformation capacity at Fatehgarh (TBCB) with 3x500MVA, 400/220kV transformers
- xiii) Establishment of 765/400/220kV, 5X1500MVA, 6x500 MVA pooling station at suitable location near Fatehgarh in Jaisalmer Distt (Fatehgarh-2)
- xiv) Fatehgarh-2 – Bhadla -2 765kV D/c line -130km
- xv) LILO of 400kV Fatehgarh (TBCB) – Bhadla (PG) D/c line at Fatehgarh-2 – 20km
- xvi) Charging of 400kV Fatehgarh-2 –Bhadla section at 765kV level
- xvii) Ajmer (PG)– Jhatikara 765kV D/c line -360 km
- xviii) 1x125 MVAr (420kV), 1x240 MVAr Bus Reactor each at Fatehgarh-2, Bhadla-2 &Khetri Substation
- xix) 1x330 MVAR Switchable Line reactors each at Ajmer &Jhatikara end for Ajmer – Jhatikara 765kV D/c line
- xx) 1x240 MVAr Switchable line reactor at each end of Bikaner – Khetri 765kV D/c line
- xxi) 1x330 MVAr Switchable line reactor at Bhadla-2 end for Ajmer-Bhadla-2 765kV line (after LILO)
- xxii) 220kV line bays for interconnection of solar projects at Fatehgarh-2, Fatehgarh, Bhadla, Bhadla-2 and Bikaner S/s- to be discussed in view of CERC regulation
- xxiii) Provision of 220kV Bus couplers +TBC & common facilities at pooling/substation i.e. Fatehgarh, Fatehgarh-2, Khetri, Bhadla-2, Bikaner, Bhadla under ISTS as per regulation – under the scope of ISTS

Part B: Transmission system for evacuation of power from Ramgarh/Kuchcheri in Fatehgarh (1.15 GW\*)

- i) Establishment of 400/220kV 3x500 MVA pooling station at suitable location in Jaisalmer Distt (near Ramgarh/Kuchheri)

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- ii) Ramgarh/Kuchheri pooling station –Fatehgarh-2 400 kV 2xD/c Line (Twin HTLS on M/c tower) -150 km
- iii) Ramgarh/Kuchheri pooling sttation – Jaisalmer -2 (RVPN) 400 kV D/c Line (Twin HTLS)- 60 km
- iv) 220kV line bays for interconnection of solar projects at Ramgarh/Kuchheri pooling station-- to be discussed in view of CERC regulation
- v) Provision of 220kV Bus couplers +TBC & common facilities at Ramgarh/Kuchheri PS

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Basu

Chandra

Gupta

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Annex-III

- 1) Establishment of 765/400/220kV, 3x1500MVA (765/400kV), 5x500 MVA (400/220kV) pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-2)
- 2) Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri
- 3) Augmentation of transformation capacity at Bhadla (PG) by 400/220kV, 2x500MVA (6<sup>th</sup>&7<sup>th</sup>) transformers
- 4) Installation of 400/220kV, 2x500MVA transformers at Bikaner (PG)
- 5) LILO of 765kV Ajmer – Bikaner D/c line at Bhadla-2
- 6) Bhadla-2 –Bhadla (PG) 400kV D/c Line (Twin HTLS)
- 7) Bikaner(PG) – Khetri S/s 765kV D/c line
- 8) LILO of 765kV Phagi – Bhiwani D/c line at Khetri S/s
- 9) Khetri – Sikar (PG) 400kV D/c line (Twin HTLS)
- 10) Augmentation with 765/400kV, 1x1500MVA transformer (3<sup>rd</sup>) at Moga S/s
- 11) Augmentation with 765/400kV ,1x1000MVA, transformer (3<sup>rd</sup>) at Bhiwani (PG) S/s
- 12) Establishment of Transformation capacity at Fatehgarh (TBCB) with 3x500MVA, 400/220kV transformers
- 13) Establishment of 400/220kV, 4X1500MVA (765/400kV), 5x500 MVA(400/220kV) pooling station at suitable location near Fatehgarh in Jaisalmer Distt (Fatehgarh-2)
- 14) Fatehgarh-2 – Bhadla -2 765kV D/c line
- 15) LILO of Fatehgarh (TBCB) – Bhadla (PG) D/c (765kV line op. at 400kV) line at Fatehgarh-2 so as to establish Fatehgarh (TBCB) – Fatehgarh -2 400kV D/c line (765kV line op. at 400kV) and Fatehgarh -2- Bhadla 400kV D/c line (765kV line op. at 400kV)
- 16) Charging of Fatehgarh-2 –Bhadla section at 765kV level
- 17) Ajmer (PG)– Jhatikara 765kV D/c line
- 18) 1x125 MVar (420kV), 2x240 MVar(765kV) Bus Reactor each at Fatehgarh-2, Bhadla-2 &Khetri Substation
- 19) 1x330 MVAR Switchable Line reactors each at Ajmer &Jhatikara end for Ajmer – Jhatikara 765kV D/c line
- 20) 1x240 MVar Switchable line reactor at each end of Bikaner – Khetri 765kV D/c line
- 21) 1x330 MVar Switchable line reactor at Bhadla-2 end for Ajmer-Bhadla-2 765kV line (after LILO)
- 22) 1x240MVar Switchable line reactor at Bhadla-2 end for Bikaner-Bhadla-2 765kV line (after LILO)
- 23) 220kV line bays for interconnection of solar projects at Fatehgarh-2 (9nos), Bhadla-2 (9 nos) and Bikaner (4 nos) S/s

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