Amendment No. 9

Dated 05.11.2020 Request for Proposal (RfP) and Transmission Service Agreement (TSA) for selection of Transmission Service Provider through tariff based competitive bidding process to establish "Transmission System Strengthening Scheme for Evacuation of Power from Solar Energy Zones in Rajasthan (8.1 GW) under Phase-II Part-D"

<table>
<tr><th>S.No.</th><th>Existing Provision (as per original RfP)</th><th>Amended Provision</th></tr>
<tr><td colspan="3">Request for Proposal (RFP) / Transmission Service Agreement (TSA)</td></tr>
<tr><td>1.</td><td>Request for Proposal Notification Sl. No. 2 & Transmission Element of Introduction in Clause 1.2 of the RFP Document and Detailed Scope of Work of Schedule-2 of TSA
<table>
<tr><th>S. No</th><th>Name of the Transmission Element</th><th>Scheduled COD from Effective Date</th><th>Conductor Per Phase</th></tr>
<tr><td>1.</td><td>Sikar-II - Aligarh 765kV D/c line</td><td rowspan="3">18 Months (Dec' 2021)#</td><td>Hexa Zebra ACSR

The transmission lines shall consist of either Hexa Zebra ACSR or equivalent to AAAC conductor or equivalent AL59 conductor as specified under specific technical requirements in RfP.</td></tr>
<tr><td>2.</td><td>2 no. of 765 kV line bays each at Sikar-II and Aligarh for Sikar-II - Aligarh 765kV D/c line</td><td>-</td></tr>
<tr><td>3.</td><td>1x330 MVAr switchable line reactor for each circuit at each end of Sikar-II - Aligarh 765kV D/c line</td><td>-</td></tr>
</table></td><td>Request for Proposal Notification Sl. No. 2 & Transmission Element of Introduction in Clause 1.2 of the RFP Document and Detailed Scope of Work of Schedule-2 of TSA

The provisions which have already been amended vide Amendment No. 3, 4 & 6 dated 02.07.2020, 22.07.2020 & 10.09.2020 respectively is further amended as per follows:
<table>
<tr><th>S. No</th><th>Name of the Transmission Element</th><th>Scheduled COD from Effective Date</th><th>Conductor Per Phase</th></tr>
<tr><td>1.</td><td>Sikar-II - Aligarh 765kV D/c line</td><td rowspan="2">18 Months</td><td>Hexa Zebra ACSR

The transmission lines shall consist of either Hexa Zebra ACSR or equivalent to AAAC conductor or equivalent AL59 conductor as specified under specific technical requirements in RfP.</td></tr>
<tr><td>2.</td><td>2 no. of 765 kV line bays at Sikar-II for Sikar-II – Aligarh(GIS) 765kV D/c line

765kV line bays – 2* (Sikar-II S/s)</td><td>-</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>S.No.</th><th>Existing Provision (as per original RfP)</th><th>Amended Provision</th></tr>
<tr>
<td></td>
<td># Scheduled COD in months is considering Effective Date in June 2020, it is agreed that in case there is delay in achieving effective date, the schedule shall be compressed accordingly to achieve Scheduled COD by December, 2021.

Note:
a. As per MoM of 6th NCT held on 30.09.2019, it was decided that the scheme is to be implemented by December 2021.
b. * 2 nos. of 765kV GIS Line bay modules are already existing at Aligarh Substation. TSP shall utilize the same under present scope.
c. Developer of Sikar-II S/s to provide space for 2 no of 765 kV bays and space for 2 no of line reactors at Sikar-II substation
d. The spare unit of 765kV, 1x110 MVAR Reactor being provided at Sikar-II PS under 'Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part C' shall be utilized as common spare for 6x110 MVAR Switchable Line Reactors to be provided at Sikar-II PS each under 'Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part D' and 'Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part E'.
e. GA drawing indicating the available area at 765kV Aligarh Substation is attached at Annexure-C. TSP shall assess the same suitably and may procure additional land, if required.
f. The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey.</td>
<td>
<table>
<tr><td>3.</td><td>1x330 MVAr switchable line reactor for each circuit at each end of Sikar-II – Aligarh(GIS) 765kV D/c line

330MVAr, 765 kV reactor-4 (2 reactors each at Sikar-II and Aligarh)

Switching equipment for 765 kV reactor - 4 (2 Switching equipment each at Sikar-II and Aligarh)

110 MVAR, 765 kV, 1 ph Reactor (spare unit) at Aligarh-1</td><td></td><td>-</td></tr>
</table>
Note:
i. * 2 nos. of 765kV GIS line bay modules (up to SF6 to Air bushing outside GIS hall) are already available at Aligarh(GIS) Substation. TSP shall utilize the same for termination of Sikar-II – Aligarh(GIS) 765kV D/c line at Aligarh.
ii. Developer of Sikar-II S/s to provide space for 2 no of 765 kV bays and space for 2 no. of switchable line reactors at Sikar-II substation.
iii. The spare unit of 765kV, 1x110 MVAR Reactor being provided at Sikar-II PS under 'Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part C' shall be utilized as common spare for 6x110 MVAR Switchable Line Reactors to be provided at Sikar-II PS each under 'Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part D' and 'Transmission system strengthening for evacuation of power from solar energy zones in
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</tr>
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<tr><th>S.No.</th><th>Existing Provision (as per original RfP)</th><th>Amended Provision</th></tr>
<tr><td></td><td></td><td>Rajasthan (8.1 GW) under Phase II –Part E’.
iv. GA drawing indicating the available area at 765kV Aligarh Substation is attached. TSP shall assess the same suitably and may procure additional land, if required.</td></tr>
<tr><td>2.</td><td>Project Schedule in Clause No. 2.6.1 of the RFP Document and Schedule - 3 of TSA
<table>
<tr><th>Sr. No</th><th>Name of the Transmission Element</th><th>Scheduled COD in months from Effective Date</th><th>Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project</th><th>Element(s) which are pre-required for declaring the commercial operation (COD) of the respective Element</th></tr>
<tr><td>1.</td><td>Sikar-II – Aligarh 765kV D/c line</td><td rowspan="3">18 Months (Dec’ 2021)#</td><td>88.74</td><td rowspan="3">Elements marked at Sl. No. 1 to 3 are required to be commissioned simultaneously as their utilization is dependent on commissioning of each</td></tr>
<tr><td>2.</td><td>2 no. of 765 kV line bays each at Sikar-II and Aligarh for Sikar-II – Aligarh 765kV D/c line</td><td>4.60</td></tr>
<tr><td>3.</td><td>1x330 MVAr switchable line reactor for each circuit at each end of Sikar-II – Aligarh 765kV D/c line</td><td>6.66</td></tr>
</table></td><td>Project Schedule in Clause No. 2.6.1 of the RFP Document and Schedule - 3 of TSA

The provisions which have already been amended vide Amendment No. 3, 4 & 6 dated 02.07.2020, 22.07.2020 & 10.09.2020 respectively is further amended as per follows:
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<tr><th>Sr. No</th><th>Name of the Transmission Element</th><th>Scheduled COD in months from Effective Date</th><th>Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project</th><th>Element(s) which are pre-required for declaring the commercial operation (COD) of the respective Element</th></tr>
<tr><td>1.</td><td>Sikar-II – Aligarh 765kV D/c line</td><td rowspan="2">18 Months</td><td rowspan="2">100 %</td><td rowspan="2">Elements marked at Sl. No. 1 to 3 are required to be commissioned simultaneous</td></tr>
<tr><td>2.</td><td>2 no. of 765 kV line bays at Sikar-II for Sikar-II – Aligarh(GIS) 765kV D/c line

765kV line bays – 2* (Sikar-II S/s)</td></tr>
</table></td></tr>
</table>

S.No.	Existing Provision (as per original RfP)	Amended Provision

Existing Provision (as per original RfP):

				other.

Scheduled COD in months is considering Effective Date in June 2020, it is agreed that in case there is delay in achieving effective date, the schedule shall be compressed accordingly to achieve Scheduled COD by December, 2021.

Note:

i. As per MoP notification dated 24/01/2020, completion schedule of the scheme is Dec' 21

ii. 2 nos. of 765kV GIS Line bay modules are already existing at Aligarh Substation. TSP shall utilize the same under present scope.

iii. Developer of Sikar-II S/s to provide space for 2 no of 765 kV bays and space for 2 no of line reactors at Sikar-II substation

The payment of Transmission Charges for any Element irrespective of its successful commissioning on or before its Scheduled COD shall only be considered after successful commissioning of the Element(s) which are pre-required for declaring the commercial operation of such Elements as mentioned in the above table.

Scheduled COD for overall Project: 18 months from Effective Date. Scheduled COD in months is considering Effective Date in June 2020, it is agreed that in case there is delay in achieving effective date, the schedule shall be compressed accordingly to achieve Scheduled COD by December, 2021.

Amended Provision:

3.	1x330 MVAr switchable line reactor for each circuit at each end of Sikar-II – **Aligarh(GIS)** 765kV D/c line **330MVAr, 765 kV reactor- 4 (2 reactors each at Sikar-II and Aligarh)** **Switching equipment for 765 kV reactor - 4 (2 Switching equipment each at Sikar-II and Aligarh)** **110 MVAR, 765 kV, 1 ph Reactor (spare unit) at Aligarh-1**			ly as their utilization is dependent on commissioning of each other.

Note:

*i. *** 2 nos. of 765kV GIS line bay modules (up to SF6 to Air bushing outside GIS hall) are already available at Aligarh(GIS) Substation. TSP shall utilize the same for termination of Sikar-II – Aligarh(GIS) 765kV D/c line at Aligarh.***

*ii. **Developer of Sikar-II S/s to provide space for 2 no of 765 kV bays and space for 2 no of switchable line reactors at Sikar-II substation.***

iii. The spare unit of 765kV, 1x110 MVAR Reactor being provided at Sikar-II PS under 'Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part C' shall be utilized as common spare for 6x110 MVAR Switchable Line Reactors to be provided at Sikar-II PS each under 'Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part D' and 'Transmission system

<table>
<tr><th>S.No.</th><th>Existing Provision (as per original RfP)</th><th>Amended Provision</th></tr>
<tr><td></td><td></td><td>strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part E’.
iv. GA drawing indicating the available area at 765kV Aligarh Substation is attached. TSP shall assess the same suitably and may procure additional land, if required.

The payment of Transmission Charges for any Element irrespective of its successful commissioning on or before its Scheduled COD shall only be considered after successful commissioning of the Element(s) which are pre-required for declaring the commercial operation of such Elements as mentioned in the above table.

Scheduled COD for overall Project: 18 months from Effective Date.</td></tr>
<tr><td>3.</td><td>Bidders undertaking in Annexure-8 of the RFP Document

<table>
<tr><th>Sr. No</th><th>Name of the Transmission Element</th><th>Scheduled COD in months from Effective Date</th><th>Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project</th><th>Element(s) which are pre-required for declaring the commercial operation (COD) of the respective Element</th></tr>
<tr><td>1.</td><td>Sikar-II – Aligarh 765kV D/c line</td><td rowspan="2">18 Months (Dec’ 2021)#</td><td>88.74</td><td rowspan="2">Elements marked at Sl. No. 1 to 3 are required to be commissione</td></tr>
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The provisions which have already been amended vide Amendment No. 3, 4 & 6 dated 02.07.2020, 22.07.2020 & 10.09.2020 respectively is further amended as per follows:

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<tr><th>Sr. No</th><th>Name of the Transmission Element</th><th>Scheduled COD in months from Effective Date</th><th>Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project</th><th>Element(s) which are pre-required for declaring the commercial operation (COD) of the respective Element</th></tr>
<tr><td>1.</td><td>Sikar-II – Aligarh 765kV D/c line</td><td>18 Months</td><td>100 %</td><td>Elements marked at Sl.</td></tr>
</table></td></tr>
</table>

S.No.	Existing Provision (as per original RfP)					Amended Provision				
	3.	1x330 MVAr switchable line reactor for each circuit at each end of Sikar-II – Aligarh 765kV D/c line		6.66	d simultaneously as their utilization is dependent on commissioning of each other.	2.	**2 no. of 765 kV line bays at Sikar-II for Sikar-II – Aligarh(GIS) 765kV D/c line** **765kV line bays – 2* (Sikar-II S/s)**			No. 1 to 3 are required to be commissioned simultaneously as their utilization is dependent on commissioning of each other.
						3.	1x330 MVAr switchable line reactor for each circuit at each end of Sikar-II – **Aligarh(GIS)** 765kV D/c line **330MVAr, 765 kV reactor- 4 (2 reactors each at Sikar-II and Aligarh)** **Switching equipment for 765 kV reactor - 4 (2 Switching equipment each at Sikar-II and Aligarh)** **110 MVAR, 765 kV, 1 ph Reactor (spare unit) at Aligarh-1**			
	# Scheduled COD in months is considering Effective Date in June 2020, it is agreed that in case there is delay in achieving effective date, the schedule shall be compressed accordingly to achieve Scheduled COD by December, 2021. Note: *i. As per MoP notification dated 24/01/2020, completion schedule of the scheme is Dec' 21* *ii. 2 nos. of 765kV GIS Line bay modules are already existing at Aligarh Substation. TSP shall utilize the same under present scope.* *iii. Developer of Sikar-II S/s to provide space for 2 no of 765 kV bays and space for 2 no of line reactors at Sikar-II substation* We agree that the payment of Transmission Charges for any Element irrespective of its successful commissioning on or before its Scheduled COD shall only be considered after successful commissioning of the Element(s) which are pre-required for declaring the commercial operation of such Element as mentioned in the above table. Scheduled COD for the Project: 18 months from the Effective Date. Scheduled COD in months is considering Effective Date in June 2020, it is agreed that in case there is delay in achieving effective date, the schedule shall be compressed accordingly to achieve Scheduled COD by December, 2021.					**Note:** *i. *** 2 nos. of 765kV GIS line bay modules (up to SF6 to Air bushing outside GIS hall) are already available at Aligarh(GIS) Substation. TSP shall utilize the same for termination of Sikar-II – Aligarh(GIS) 765kV D/c line at Aligarh.*** *ii. **Developer of Sikar-II S/s to provide space for 2 no of 765 kV bays and space for 2 no. of switchable line reactors at Sikar-II substation.*** *iii. The spare unit of 765kV, 1x110 MVAR Reactor being provided at Sikar-II*			

S.No.	Existing Provision (as per original RfP)	Amended Provision
		PS under 'Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part C' shall be utilized as common spare for 6x110 MVAR Switchable Line Reactors to be provided at Sikar-II PS each under 'Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part D' and 'Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part E'. *iv. GA drawing indicating the available area at 765kV Aligarh Substation is attached. TSP shall assess the same suitably and may procure additional land, if required.* We agree that the payment of Transmission Charges for any Element irrespective of its successful commissioning on or before its Scheduled COD shall only be considered after successful commissioning of the Element(s) which are pre-required for declaring the commercial operation of such Element as mentioned in the above table. Scheduled COD for the Project: 18 months from Effective Date.
4.	**Annexure-17: List of Banks, Sl. No. 2 Foreign Banks**	**Annexure-17: List of Banks, Sl. No. 2 Foreign Banks** **15. DBS Bank Ltd.**
5.	**Article:1 of TSA** "Availability" in relation to the Project or in relation to any Element of the Project, for a given period shall mean the time in hours during that period the Project is capable to transmit electricity at its Rated Voltage and shall be expressed in percentage of total hours in the given period and shall be calculated as per the procedure contained in Appendix –III to Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 attached herewith in Schedule 9;	**Article: 1 of TSA** "Availability" in relation to the Project or in relation to any Element of the Project, for a given period shall mean the time in hours during that period the Project is capable to transmit electricity at its Rated Voltage and shall be expressed in percentage of total hours in the given period and shall be calculated as per the procedure contained in **Appendix –II to Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019** attached herewith in Schedule 9;

S.No.	Existing Provision (as per original RfP)	Amended Provision
6.	**Article:1 of TSA** "Unscheduled Interchange" shall have the meaning ascribed thereto in Rule 24 of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2014 as amended from time to time;	**Article: 1 of TSA** "Unscheduled Interchange" shall have the meaning ascribed thereto in Rule 24 of the **Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2019** as amended from time to time;
7.	**Article: 8 of TSA** 8.1 Calculation of Availability of the Project Calculation of Availability for the Elements and for the Project, as the case may be, shall be as per Appendix III of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014, as applicable seven (7) days prior to the Bid Deadline and as appended in Schedule 9.	**Article: 8 of TSA** 8.1 Calculation of Availability of the Project Calculation of Availability for the Elements and for the Project, as the case may be, shall be as per **Appendix –II of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019**, as applicable seven (7) days prior to the Bid Deadline and as appended in Schedule 9.
8.	**Article: 11 of TSA** 11.7 Available Relief for a Force Majeure Event a……. b…… c. For the avoidance of doubt, it is clarified that the computation of Availability of the Element(s) under outage due to Force Majeure Event, as per Article 11.3 affecting the TSP shall be as per Appendix III to the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2014, as on seven (7) days prior to the Bid Deadline. For the event(s) for which the Element(s) is/are deemed to be available as per Appendix III to the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2014, then only the Non Escalable Transmission Charges, as applicable to such Element(s) in the relevant Contract Year, shall be paid by the Long Term Transmission Customers as per Schedule 5, for the duration of such event(s).	**Article: 11 of TSA** 11.7 Available Relief for a Force Majeure Event a……. b…… c. For the avoidance of doubt, it is clarified that the computation of Availability of the Element(s) under outage due to Force Majeure Event, as per Article 11.3 affecting the TSP shall be as per **Appendix II to the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2019**, as on seven (7) days prior to the Bid Deadline. For the event(s) for which the Element(s) is/are deemed to be available as per **Appendix II to the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2019**, then only the Non Escalable Transmission Charges, as applicable to such Element(s) in the relevant Contract Year, shall be paid by the Long Term Transmission Customers as per Schedule 5, for the duration of such event(s).
9.	**Schedule: 5 of TSA** Clause No. 1.1 (g) The Availability shall be calculated as per the procedure specified in Appendix III of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 as notified by CERC and as	**Schedule: 5 of TSA** Clause No. 1.1 (g) The Availability shall be calculated as per the procedure specified in **Appendix II of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2019** as notified by CERC and as attached

<table>
<tr><th>S.No.</th><th>Existing Provision (as per original RfP)</th><th>Amended Provision</th></tr>
<tr><td></td><td>attached herewith.</td><td>herewith.</td></tr>
<tr><td>10.</td><td>Schedule: 9 of TSA

Appendix III of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014</td><td>Schedule: 9 of TSA

Appendix II of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2019 as Attached at Annex-A herewith.</td></tr>
<tr><td>11.</td><td>Annexure-23

Tariff Illustration Sheet</td><td>Annexure-23

Tariff Illustration Sheet

The MS Excel Sheet is attached at Annexure-III for reference only</td></tr>
<tr><td>12.</td><td>Clause No 2.7.1 of RfP

The Bidders should submit the Bids online through the electronic bidding platform before the Bid Deadline and submit the Technical Bids, in one (1) original plus one (1) copy so as to reach the address specified in Clause 2.9.4 by 1200 hrs. (IST) on 11.11.2020</td><td>Clause No 2.7.1 of RfP

The Bidders should submit the Bids online through the electronic bidding platform before the Bid Deadline and submit the Technical Bids, in one (1) original plus one (1) copy so as to reach the address specified in Clause 2.9.4 by 1200 hrs. (IST) on 26.11.2020.</td></tr>
<tr><td>13.</td><td>Clause No 2.7.2 of RfP
Important timelines are mentioned below:<table><tr><th>Date</th><th>Event</th></tr><tr><td>11.11.2020</td><td>Submission of Bid (Online submission of Bid through electronic bidding portal and physical submission of Technical Bid)</td></tr><tr><td>11.11.2020</td><td>Opening of Technical Bid</td></tr><tr><td>19.11.2020</td><td>Shortlisting and announcement of Qualified Bidders</td></tr><tr><td>20.11.2020</td><td>Opening of Financial Bid - Initial Offer</td></tr><tr><td>23.11.2020</td><td>Electronic auction (Financial Bid – Final Offer) for the Qualified Bidders</td></tr><tr><td>01.12.2020</td><td>Selection of Successful Bidder and issue of LoI</td></tr><tr><td>11.12.2020</td><td>Signing of RFP Project Documents and transfer of SPV (Sikar-II Aligarh Transmission Limited)</td></tr></table></td><td>Clause No 2.7.2 of RfP
Important timelines are mentioned below:<table><tr><th>Date</th><th>Event</th></tr><tr><td>26.11.2020</td><td>Submission of Bid (Online submission of Bid through electronic bidding portal and physical submission of Technical Bid)</td></tr><tr><td>26.11.2020</td><td>Opening of Technical Bid</td></tr><tr><td>04.12.2020</td><td>Shortlisting and announcement of Qualified Bidders</td></tr><tr><td>07.12.2020</td><td>Opening of Financial Bid - Initial Offer</td></tr><tr><td>08.12.2020</td><td>Electronic auction (Financial Bid – Final Offer) for the Qualified Bidders</td></tr><tr><td>16.12.2020</td><td>Selection of Successful Bidder and issue of LoI</td></tr><tr><td>28.12.2020</td><td>Signing of RFP Project Documents and transfer of SPV (Sikar-II Aligarh Transmission Limited)</td></tr></table></td></tr>
</table>

S.No.	Existing Provision (as per original RfP)	Amended Provision
14.	**Clause No 2.9.2 of RFP** ……. Due for opening on 11.11.2020	**Clause No 2.9.2 of RFP** …… Due for opening on **26.11.2020**
15.	**Clause No 2.13.1 of RFP** …… Opening of Envelope (Technical Bid): 1230 hours (IST) on 11.11.2020. Opening of Initial Offer: Initial Offer shall be opened by the Bid Process Coordinator in presence of the Bid Evaluation Committee at 1200 hours (IST) on 20.11.2020	**Clause No 2.13.1 of RFP** …… Opening of Envelope (Technical Bid): 1230 hours (IST) on **26.11.2020**. Opening of Initial Offer: Initial Offer shall be opened by the Bid Process Coordinator in presence of the Bid Evaluation Committee at 1200 hours (IST) on **07.12.2020**

Appendix-II

Procedure for Calculation of Transmission System Availability Factor for a Month

1. Transmission system availability factor for n^{th} calendar month ("TAFPn") shall be calculated by the respective transmission licensee, got verified by the concerned Regional Load Dispatch Centre (RLDC) and certified by the Member-Secretary, Regional Power Committee of the region concerned, separately for each AC and HVDC transmission system and grouped according to sharing of transmission charges. In case of AC system, transmission System Availability shall be calculated separately for each Regional Transmission System and inter-regional transmission system. In case of HVDC system, transmission System Availability shall be calculated on consolidate basis for all inter-state HVDC system.

2. Transmission system availability factor for n^{th} calendar month ("TAFPn") shall be calculated by consider following:

i) **AC transmission lines:** Each circuit of AC transmission line shall be considered as one element;

ii) **Inter-Connecting Transformers (ICTs):** Each ICT bank (three single phase transformer together) shall form one element;

iii) **Static VAR Compensator (SVC):** SVC along with SVC transformer shall form one element;

iv) **Bus Reactors or Switchable line reactors**: Each Bus Reactors or Switchable line reactors shall be considered as one element;

v) **HVDC Bi-pole links:** Each pole of HVDC link along with associated equipment at both ends shall be considered as one element;

vi) **HVDC back-to-back station:** Each block of HVDC back-to-back station shall be considered as one element. If associated AC line (necessary for

transfer of inter- regional power through HVDC back-to-back station) is not available, the HVDC back-to-back station block shall also be considered as unavailable;

vii) **Static Synchronous Compensation ("STATCOM"):** Each STATCOM shall be considered as separate element.

3. The Availability of AC and HVDC portion of Transmission system shall be calculated by considering each category of transmission elements as under:

TAFMn (in %) for AC system:

$$= \frac{o \text{ X AVo})+(p \text{ X AVp}) + (q \text{ X AVq}) + (r \text{ X AVr})+(u \text{ X AVu})}{(o + p + q + r+u)} \text{x100}$$

Where,

o	=	Total number of AC lines.
AVo	=	Availability of o number of AC lines.
p	=	Total number of bus reactors/switchable line reactors
AVp	=	Availability of p number of bus reactors/switchable line reactors
q	=	Total number of ICTs.
AVq	=	Availability of q number of ICTs.
r	=	Total number of SVCs.
AVr	=	Availability of r number of SVCs
u	=	Total number of STATCOM.
AVu	=	Availability of u number of STATCOMs

<u>TAFMn (in %) for HVDC System:</u>

$$= \frac{\sum_{x=1}^{s} \text{Cxbp(act) X AVxbp} + \sum_{y=1}^{t} \text{Cy(act)btb X AVybtb}}{\sum_{x=1}^{s} \text{Cxbp} + \sum_{y=1}^{t} \text{Cybtb}} \text{ x 100}$$

Where

Cxbp(act) = Total actual operated capacity of x^{th} HVDC pole

Cxbp = Total rated capacity of x^{th} HVDC pole

AVxbp	=	Availability of x^{th} HVDC pole
Cybtb(act)	=	Total actual operated capacity of y^{th} HVDC back-to-back station block
Cybtb	=	Total rated capacity of y^{th} HVDC back-to-back station block
AVybtb	=	Availability of y^{th} HVDC back-to-back station block
s	=	Total no of HVDC poles
t	=	Total no of HVDC Back to Back blocks

3. The availability for each category of transmission elements shall be calculated based on the weightage factor, total hours under consideration and non-available hours for each element of that category. The formulae for calculation of Availability of each category of the transmission elements are as per **Appendix-III**. The weightage factor for each category of transmission elements shall be considered asunder:

(a) For each circuit of AC line – Number of sub-conductors in the line multiplied by ckt-km;

(b) For each HVDC pole- The rated MW capacity x ckt-km;

(c) For each ICT bank – The rated MVA capacity;

(d) For SVC- The rated MVAR capacity (inductive and capacitive);

(e) For Bus Reactor/switchable line reactors – The rated MVAR capacity;

(f) For HVDC back-to-back station connecting two Regional grids- Rated MW capacity of each block; and

(g) For STATCOM – Total rated MVAR Capacity.

4. The transmission elements under outage due to following reasons shall be deemed to be available:

i. Shut down availed for maintenance of another transmission scheme or construction of new element or renovation/upgradation/additional capitalization in existing system approved by the Commission. If the other transmission scheme belongs to the transmission licensee, the Member-

Secretary, RPC may restrict the deemed availability period to that considered reasonable by him for the work involved. In case of dispute regarding deemed availability, the matter may be referred to Chairperson, CEA within 30 days.

ii. Switching off of a transmission line to restrict over voltage and manual tripping of switched reactors as per the directions of concerned RLDC.

5. For the following contingencies, outage period of transmission elements, as certified by the Member Secretary, RPC, shall be excluded from the total time of the element under period of consideration for the following contingencies:

i) Outage of elements due to acts of God and force majeure events beyond the control of the transmission licensee. However, whether the same outage is due to force majeure (not design failure) will be verified by the Member Secretary, RPC.A reasonable restoration time for the element shall be considered by Member Secretary, RPC and any additional time taken by the transmission licensee for restoration of the element beyond the reasonable time shall be treated as outage time attributable to the transmission licensee. Member Secretary, RPC may consult the transmission licensee or any expert for estimation of reasonable restoration time. Circuits restored through ERS (Emergency Restoration System) shall be considered as available;

ii) Outage caused by grid incident/disturbance not attributable to the transmission licensee, e.g. faults in substation or bays owned by other agency causing outage of the transmission licensee's elements, and tripping of lines, ICTs, HVDC, etc. due to grid disturbance. However, if the element is not restored on receipt of direction from RLDC while normalizing the system following grid incident/disturbance within reasonable time, the element will be considered not available for the period of outage after issuance of RLDC's direction for restoration;

Provided that in case of any disagreement with the transmission licensee regarding reason for outage, same may be referred to Chairperson, CEA within

30 days. The above need to be resolved within two months:

Provided further that where there is a difficulty or delay beyond sixty days, from the incidence in finalizing the recommendation, the Member Secretary of concerned RPC shall allow the outage hours on provisional basis till the final view.

6. Time frame for certification of transmission system availability: (1) Following schedule shall be followed for certification of availability by Member Secretary of concerned RPC:

- Submission of outage data by Transmission Licensees to RLDC/ constituents – By 5th of the following month;
- Review of the outage data by RLDC / constituents and forward the same to respective RPC – by 20th of the month;
- Issue of availability certificate by respective RPC – by 3rd of the next month.

Appendix-III

FORMULAE FOR CALCULATION OF AVAILABILITY OF EACH CATEGORY OF TRANSMISSION ELEMENTS

For AC transmission system

AVo(Availability of o no. of AC lines) = $\frac{\sum_{i=1}^{o} Wi(Ti - TNAi)/Ti}{\sum_{i=1}^{o} Wi}$

AVq(Availability of q no. of ICTs) = $\frac{\sum_{k=1}^{q} Wk(Tk - TNAk)/Tk}{\sum_{k=1}^{q} Wk}$

AVr(Availability of r no. of SVCs) = $\frac{\sum_{l=1}^{r} Wl(Tl - TNAl)/Tl}{\sum_{l=1}^{r} Wl}$

AVp(Availability of p no. of Switched Bus reactors) = $\frac{\sum_{m=1}^{p} Wm(Tm - TNAm)/Tm}{\sum_{m=1}^{p} Wm}$

AVu(Availability of u no. of STATCOMs) = $\frac{\sum_{n=1}^{u} Wn(Tn - TNAn)/Tn}{\sum_{n=1}^{u} Wn}$

AV_{xbp}(Availability of an individual HVDC pole) = $\frac{(Tx - TN\ \ )}{Tx}$

AV_{ybtb} (Availability of an individualHVDC Back-to-back Blocks) $= \frac{(Ty - TNAy)}{Ty}$

For HVDC transmission system

For the new HVDC commissioned but not completed twelve months;

For first 12 months: [(AV_{xbp} or AV_{ybtb})x95%/85%], subject to ceiling of 95%.

Where,

o	=	Total number of AC lines;
AVo	=	Availability of o number of AC lines;
p	=	Total number of bus reactors/switchable line reactors;
AVp	=	Availability of p number of bus reactors/switchable line reactors;
q	=	Total number of ICTs;
AVq	=	Availability of q number of ICTs;
r	=	Total number of SVCs;
AVr	=	Availability of r number of SVCs;.
U	=	Total number of STATCOM;

AVu	=	Availability of u number of STATCOMs;
W*i*	=	Weightage factor for *i*th transmission line;
W*k*	=	Weightage factor for *k*th ICT;
W*l*	=	Weightage factors for inductive & capacitive operation of *l*th SVC;
Wm	=	Weightage factor for mth bus reactor;
Wn	=	Weightage factor for nth STATCOM.

T*i*, , T*k*, T*l*, , - T*m*, T*n, Tx, Ty*	The total hours of ith AC line, kth ICT, lth SVC, *m*th Switched Bus Reactor & nth STATCOM, xth HVDC pole, yth HVDC back-to-back blocks during the period under consideration (excluding time period for outages not attributable to transmission licensee for reasons given in Para 5of the procedure)
$T_{NA}i$, $T_{NA}k$ - $T_{NA}l$, $T_{NA}m$, $T_{NA}n$, $T_{NAx,}$ $T_{NA}y$	The non-availability hours (excluding the time period for outages not attributable to transmission licensee taken as deemed availability as per Para 5 of the procedure) for ith AC line, *k*th ICT, lth SVC , *m*th Switched Bus Reactor, nth STATCOM, xth HVDC pole and ythHVDC back-to-back block .