

फैक्स/स्पीड पोस्ट /FAX/SPEEDPOST

भारत सरकार केंद्रीय विद्युत प्राधिकरण दक्षिण क्षेत्रीय विद्युत समिति बेंगलूरु - 560 009	 सत्यमेव जयते	Government of India Central Electricity Authority Southern Regional Power Committee Bengaluru - 560 009	
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सं/No. SRPC/SE-II/2018		दिनांक / Date	11.07.2018

To

1. Chief Engineer (Elec.), Load Despatch Centre, KPTCL, Bengaluru
2. Chief Engineer (Planning & Coordination), Cauvery Bhavan, KPTCL, Bengaluru
3. Chief Engineer (RTand R&D), Cauvery Bhavan, KPTCL, Bengaluru
4. Chief Engineer, (ED), KPCL, Bengaluru
5. Head Operation, UPCL, Padubidri, Udupi
6. General Manager, SR-II, PGCIL, Bengaluru
7. General Manger, SRLDC, Bengaluru

Sir,

**Sub: Minutes of the Special Meeting on pending issues in respect of Karnataka System held on 09.07.2018 -Reg**

Minutes of the Special Meeting on pending issues in respect of Karnataka System held on **09.07.2018 at SRPC, Bengaluru** have been uploaded at SRPC website [www.srpc.kar.nic.in](http://www.srpc.kar.nic.in)

धन्यवाद /Thanking you,

भवदीय / Yours faithfully



(असित सिंह / Asit Singh)

अधीक्षक अभियंता / Superintending Engineer

Copy for kind information to:-

1. Director (Transmission), KPTCL, Bengaluru
2. Technical Director, KPCL, Bengaluru

**Southern Regional Power Committee, Bengaluru**  
**Minutes of the Special Meeting on pending issues in respect of Karnataka System**  
**held on 09.07.2018**

**1. Introduction**

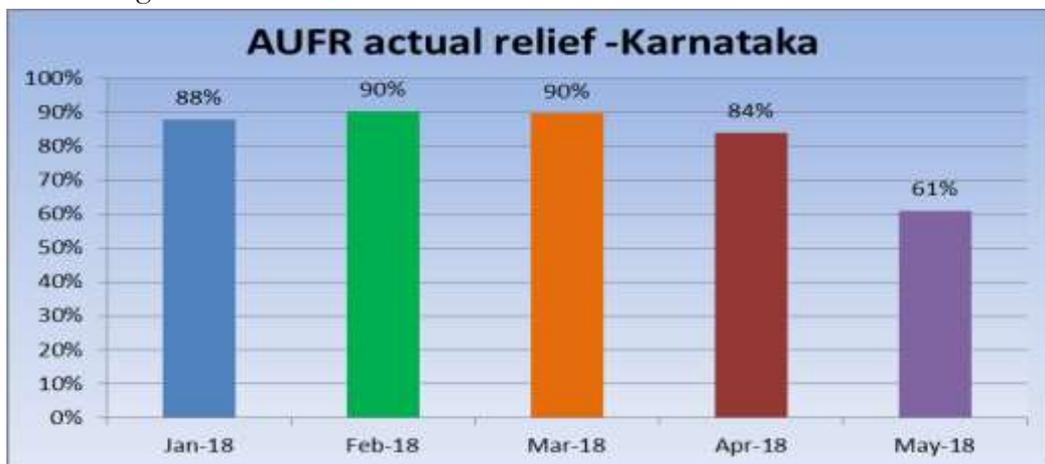
A Special Meeting on pending issues in respect of Karnataka System was held on 09<sup>th</sup> July 2018 at SRPC, Bengaluru. The list of participants is enclosed at **Annexure-I**. Representatives from different wings of KPTCL, KPCL (HQ and stations), SR-II, BESCOM, UPCL, SRLDC and SRPC participated in this Meeting.

Shri S R, Bhat, MS, SRPC welcomed all the participants to the Meeting. He stated that it was heartening to see good representation from KPTCL and KPCL from various wings/generating stations etc. The Meeting was being held to have pinpointed deliberations on various pending issues in respect of Karnataka System and he hoped on fruitful deliberations. He also welcomed Shri Abhimanyu Gartia, General Manager, SRLDC and hoped that under his able leadership, SRLDC would reach greater heights.

The Agenda was taken for discussion.

**2. UFR related issues**

- NPC Secretariat vide letter dated 10<sup>th</sup> May 2018 had furnished UFR quantum to be adopted by SR in the current Grid Environment, which was to be ratified by NPC. Further NPC Secretariat had sought comments on retaining the same set points (49.2 Hz, 49.0 Hz, 48.8 Hz & 48.6 Hz) or enhancing the set points by 0.2 Hz (49.4 Hz, 49.2 Hz, 49.0 Hz & 48.8 Hz)
  - **KPTCL agreed for enhancing the set points by 0.2 Hz for each stage.**
- SRLDC presented the decreasing visualization of relief on UFR and df/dt mapped feeders as given below:



- KPTCL informed that this issue had been examined in detail. Besides fall in average demand, there had been instances of renewable power being injected at lower voltages level affecting net load relief and even in some cases, there had been reversal of power flow. KPTCL had taken action to identify radial feeders at lower voltages level (where numerical relays were available with f+t set points feature) and avoid the mixed feeders (load and RE). Works had been completed in three Transmission Zones and the same was being taken up in other transmission zones. **After reconfiguration at lower voltages levels, the relevant details would be**

communicated to SCADA team for mapping at SLDC and also further communicating to SRLDC. With this exercise, the visible relief was likely to improve.

- MS, SRPC noted that renewable injection at lower voltages levels may impact reliefs in all the states in Southern Region and thus a comprehensive review needs to be taken up. The mapping was being reviewed / followed up as per directives of Hon'ble CERC. He stated that the issue would need to be taken up other constituent states also.
- GM, SRLDC stated that RE feeders should not be under any load relief scheme.
- **It was agreed that the feeder wise verification for the month of May 2018 would be carried out with respect to March 2018 (less wind injection) so as to assess average loading / reversal of flows, for necessary corrective action.** SRLDC / KAR SLDC agreed to coordinate and come out with an action plan. This exercise would be required for other states also.

### 3. Low voltages in and around Bengaluru

- SRLDC & SRPC had prepared a study report regarding the low voltage in Bengaluru 400 kV ring. It was noted that there was huge drawal of around 1,000 MVAR when the voltages were going below 380 kV.

MVAR and MW Flow in Nelamangala, Somanahalli & Hoody at different voltage level on 07<sup>th</sup> March 2018 is tabulated below:

Bus Voltage	Hoody (MVAR)	Hoody (MW)	N'gala (MVAR)	N'gala (MW)	S'halli (MVAR)	S'halli (MW)	Total (MVAR)	Total (MW)
370	479	1114	276	1171	281	891	1036	3176
375	489	1132	279	1166	279	889	1047	3187
380	491	1157	293	1167	285	894	1069	3218
385	430	1157	303	1086	266	894	999	3137
390	380	1077	269	1076	216	838	865	2991
395	309	965	258	1003	156	750	723	2718
400	265	935	256	1023	132	735	653	2693
405	153	797	198	933	65	638	416	2368

- Delay in commissioning of capacitors was also leading to more MVAR drawal from ISTS coupled with low voltage scenario. The status of capacitor installation is as given below:

Utility	Reactive Power Planning	Voltage level	Remarks
KPTCL	Bengaluru Tr. Zone:784 MVAR	12.1 kV	LOA issued 30 MVAR Installed
	Bagalkot Tr. Zone:258.1 MVAR	12.1 kV	Material supplied. Execution completed / under progress.78.3 MVAR installed
	Hassan Tr. Zone:150.8 MVAR		Material supplied. Execution completed / under progress.43.5 MVAR installed
	Mysore Tr. Zone:60.9 MVAR		60.9 MVAR commissioned
	Gulbarga Tr. Zone:98.60 MVAR		Installed Nil
	Tumkur Tr. Zone:281.3 MVAR	12.1 kV	46.4 MVAR commissioned. 34.8 MVAR E1 approval awaited.

- Status of capacitors installation as furnished by KPTCL is at **Annexure-II**.
- SRPC & SRLDC expressed concern that though this issue was highlighted two years back , adequate reactive compensation was not in place.

- SRLDC pointed out that a number of substations were being operated in split mode (feeding radial loads) thus hence having low short circuit levels. Any loading above SIL was adversely affecting voltage levels due to less short circuit level. High reactive drawal affected the voltage level and the power drawing capacity. Heavily loaded lines operating in split mode not only reduced reliability but also increased impedance (hence low short circuit) leading to low voltage operations.
- KPTCL informed that the issue had also been taken up by MD, KPTCL with MD, BESCOM and subsequently followed up by SLDC. Capacitor installation in Bengaluru area had been delayed on account of a number of unavoidable issues (contractual/legal). **153 breakers for the capacitors are expected to be supplied by August 2018 and commissioning was planned to be completed by December 2018.** A comprehensive exercise had also been carried out to identify substations (space/technical constraints) where these capacitors could be installed. The switching operations would be carried out by the substation operator.
- KPTCL pointed out that **BESCOM and KPTCL will jointly work out the works to be carried out at Discom level which would address the reactive drawal from intra-state (KPTCL) grid. The MVAR drawal pattern of BESCOM would also be studied.**
- BESCOM stated that they would also study the reactive drawal patterns, permissible power factors for various consumers (in other states also) etc and if required, the same could be reviewed and taken up appropriately.
- SRPC & SRLDC pointed out the Regulation 4.61(a) of IEGC states as follows *Reactive Power compensation and/or other facilities shall be provided by STUs, and Users connected to ISTS as far as possible in the lower voltage systems close to the load points thereby avoiding the need for exchange of Reactive Power to/from ISTS and to maintain ISTS voltage within the specified range?*
- SRPC & SRLDC stated that commissioning of capacitors needs to be taken up in a time bound manner and completed by December 2018 (before the next summer picks up). Reactive compensation studies need to be carried out by KPTCL (STU) for intra-state transmission system to optimize utilization of the integrated transmission networks in line with Regulation 3.4(e) of IEGC.

#### 4. UV Relay set points

- UV Relay logic is to be changed by KPTCL. After tripping of 25 MW at 3<sup>rd</sup> minute, 50 MW would be tripped at 6<sup>th</sup> minute, 75 MW at 9<sup>th</sup> minute and 100 MW at 12<sup>th</sup> minute. This would be done on the same set of 100 MW loads identified in Stage I.
- KPTCL agreed to look into this issue and initiate corrective actions.
- Loads are to be restored only under the instructions of SLDC. In addition, SLDC to take appropriate action to ensure that the voltages remain above 380 kV.

#### 5. Ramp rates

- ISG Stations are giving ramp rate of 0.5 % /minute (at least).
- KPCL has furnished the ramp rates of 10 %/minute.

- SRPC & SRLDC emphasized on higher Ramp rates by the thermal generators in view of the substantial RE ingress into the Karnataka grid.
- KPCL informed that the Ramp rates were in the range of 0.5%.
- Karnataka SLDC stated that the ramp rates needed to be enhanced to take care of the RE variability and replacement of RE with conventional generation and vice versa.
- SRPC informed that higher Ramp rates of 1-1.5% were under consideration of NTPC.
- Further, it was noted that the new units need to provide higher Ramp rates, considering the provisions of CEA Regulations.
- **KPCL agreed to revert back on the Ramp rates and also would consider specifying higher Ramp rates for Bellary and Yeramarus units.**

## 6. Utilization of RE Generators for Reactive Compensation & High Voltage

- SRPC had circulated a note dated 24.05.2018 regarding MVAR power restrictions/support from RE generators. It was noted that feedback in this regard from KPTCL was awaited.
  - SRPC & SRLDC accentuated the need of reactive support from RE generators as the share in demand was increasing day-by-day. The inhibiting clauses in PPA, if any, need to be appropriately addressed to avail full support on reactive power interchange.
  - KPTCL informed that a circular dated 26.07.2017 (**Annexure-III**) had been issued for penalty for invalid VAR exchanges by inverter based generators. A ready reckoner on the extent of VAR to be absorbed / generated by the inverter based Generating station vis-à-vis voltage and power factor variations is appended below as a guideline:

	Voltage in % of rated voltage	Power Factor	KVAR to be supplied/absorbed by Inverter based Generator expressed as a % of KW generated
For Voltages below the rated voltage	95%	0.95 Lag	32.87% (from Generator to Grid)
	96%	0.96 Lag	29.17% (from Generator to Grid)
	97%	0.97 Lag	25.06% (from Generator to Grid)
	98%	0.98 Lag	20.30% (from Generator to Grid)
<b>DEAD BAND</b>	<b>99%</b>	<b>0.99 Lag</b>	<b>0</b>
	<b>100%</b>	<b>1.00</b>	<b>0</b>
	<b>101%</b>	<b>0.99 Lead</b>	<b>0</b>
For Voltages below the rated voltage	102%	0.98 Lead	20.30% (from Grid to Generator)
	103%	0.97 Lead	25.06% (from Grid to Generator)
	104%	0.96 Lead	29.17% (from Grid to Generator)
	105%	0.95 Lead	32.87% (from Grid to Generator)

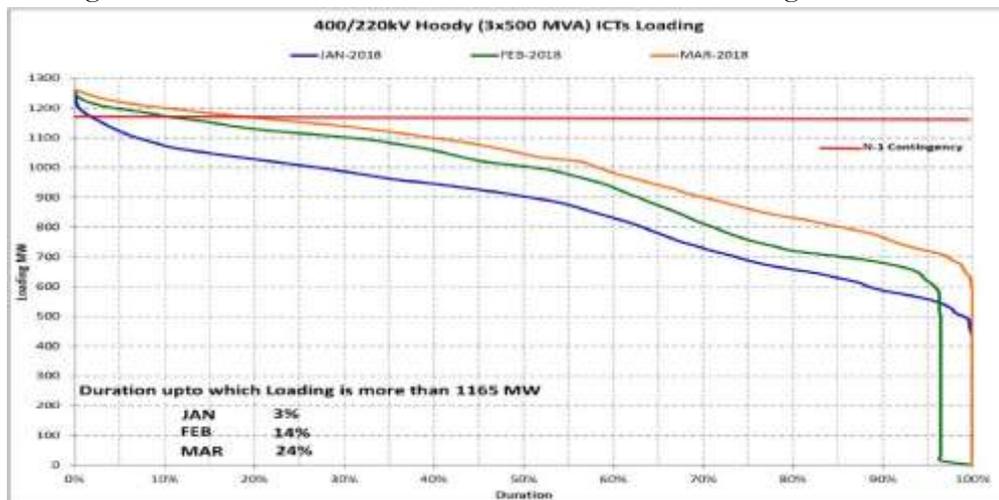
The above scheme was planned keeping in view the low voltage scenario and it takes care of the MVAR interchange during day time when active power injection is there. **However, during night time, when active drawal is from the grid and MVAR absorption is required (high voltages), the issue still needs to be addressed.** It was noted that in the recently held Meeting on 04.07.2018 for KEGC Review, it had been agreed to constitute an internal sub-committee to look into this aspect.

## 7. SPS Mock Tests

- Raichur – Solapur SPS Signal-3 (RS-3) was not received in Karnataka at 220 kV C.R. Nagar due to unhealthy links in Karnataka network.
- Kudankulam SPS Signal-1 (KK-1) could not be received at 220 kV Gowribidanur due to unhealthy link between 220 kV Doddaballapura and 220 kV Gowribidanur
  - KPTCL vide email dated 04.07.2018 had informed that problem with 220 kV Kadakola-Chamarajanagar PLCC link was attended on 23.05.2018. Further, the signal from DB Pura to Gowribidanur was rectified, checked and found OK.
  - KPTCL also requested SR-II, PGCIL to take action on their letter dated 19.06.2018 (**Annexure-IV**) on extending SPS signal to 220 kV substations in the downstream of 400 kV substations at Shantigram, Bastiputa and Guttur. SR-II, PGCIL stated that the internal wiring etc was to be carried out by KPTCL while the re-routing would be taken up by SR-II. SR-II and KPTCL agreed to coordinate in this regard.

## 8. Transmission issues

- Frequent auto reclosing of Pavagada-Bellary I & II
  - SRLDC informed about two incidents in April 2018 and six incidents in May 2018 of A/R (**Annexure-V**). There were no incidents reported in the month of June 2018.
  - KPTCL agreed to take up this issue with the Transmission Zone and furnish a copy to SRPC & SRLDC.
- Over loading of ICTs and N-1 violation at Hoody
  - SRLDC informed that there was N-1 violation of Hoody ICTs and one of the ICT was being utilized in radial mode. The violation was exhibited as given below:



- KPTCL informed that with the commissioning of cable (Yelahanka) around 200-250 MW load was expected to be transferred to Yelahanka and the issue would get addressed. The other ICT at Hoody would also get paralleled after the Yelahanka cable is commissioned.
- Cable from Yelahanka(PG) – Yelahanka (KPTCL) 6/16 sections (4.5 km out of 5.9)
  - KPTCL informed that the ROW issue at Singanayakanahalli was being resolved and the cable was planned to be commissioned by end of August 2018.
- Tumkur-Antharasanahalli D/C and Tumkur (400 kV)- Tumkur 220 kV D/C
  - KPTCL informed that the lines were stuck up at three locations. KIADB had to procure the land and handover to KPTCL. DC had fixed the compensation and the ROW was to be handed over to KPTCL after the settlements.

- It was noted that in 33<sup>rd</sup> SRPC meeting, KPTCL had assured that the lines would come up March 2018. There were significant charges being borne by KPTCL due to non-readiness system at Madhugiri without drawing power.
- **SRPC& SRLDC requested KPTCL to expedite the commissioning of the downstream system which would help in improve system operation.**
- Status update of the reactors is as given below:

Entity	Bus Name	Capacity in MVAR	Approved in	Remarks
KPTCL	Hoody		Reactor erected on platform.	<b>Being followed up with BHEL expected by December 2018. There was a meeting held on 03.07.2018 by Chief Engineer along with BHEL and the outcome would be communicated in the 145<sup>th</sup> OCCM.</b>
	Nelamangala		Reactor erected on platform.	
	Davangere	125	39 <sup>th</sup> SC	
	Talguppa	125	39 <sup>th</sup> SC	
UPCL	Udupi	2 x 125	39 <sup>th</sup> SC	41 <sup>st</sup> SCSPSR: Requirement reaffirmed

#### UPCL Reactors

- UPCL informed that concurrence from PCKL was awaited.
- KAR SLDC stated that the reactors were required to tackle high voltages in that area.
- GM, SRLDC stated that the Standing Committee approved transmission elements need to be taken up expeditiously.
- MS, SRPC stated that the issue would be taken up with PCKL.
- On a query about MVAR absorption by UPCL units, UPCL informed that the units were permitted to absorb only up to 80 MVAR. The issue was not able to be addressed during the last COH and the constraints persisted.
- **It was pointed out that the UPCL units were not performing upto the Capability Curve limits and thus it becomes more pertinent for UPCL to take up the reactor commissioning at the earliest.**

#### **9. Compliance of CEA Regulations for Grid connectivity of Renewable Energy Sources**

SCADA availability as on 30.06.2018 Mapped I/C	Remarks
Wind: 4398.895/4419.695 MW (99.53%) Solar: 4409.56/4848.55 MW (90.95%) Total: 8808.45/9268.25 MW (95.04%)	<b>KPTCL agreed to improve the SCADA availability of RE resources.</b>

#### **10. Certification of availability of Transmission system of Inter State/RPC certified lines**

- SRLDC had pointed out that the inter-state lines were to be certified by the SLDCs of both ends before submitting to SRLDC for verification. SLDCs agreed to coordinate in this regard.

- KPTCL agreed to jointly verify (both end SLDCs) the outages and reasons of inter-state lines and communicate the same to SRLDC in the required formats.
- KPTCL also agreed to verify the intra-state lines in PoC and furnished to SRLDC & SRPC in the required formats for further action.

### 11. *MVAR Testing summary*

- SRLDC presented the observations on MVAR Testing at RTPS, BTPS, Nagjheri, Kadra, Kodasalli, Sharavathy of KPCL & UPCL (**Annexure-VI**).
  - KPCL informed that the tap changing at Kadra, Sharavathy and BTPS had been completed. The under excitation set points at BTPS were under review by M/s BHEL (OEM).
  - **KPCL stated that point-wise compliance / status report would be furnished in the 145<sup>th</sup> Meeting of OCC.**

### 12. *Implementation of URTDSM (PMU) project in Southern Region*

- SRLDC agreed to render assistance to KPTCL to finalize the PMU requirement for stage-II. **This exercise would be completed within ae week** and the requirement would be communicated to SR-II.

### 13. *Black Start Mock Drill*

- KPTCL informed that BSRP mock drill has been completed from Nagjheri to Hubli. The exercise from Nagjheri to BTPS would be taken up after the wind generation reduces (October/November 2018). Bus isolation at Harti and some tapping issues were to be resolved.
- KPCL informed that the black start at Nagjheri, Supa, Sharavathy, Gerusoppa and Varahi had been completed. Other mock drills are being planned as per schedule.

### 14. *RGMO/FGMO*

- SRLDC presented the RGMO/FGMO with MI response as given below:

Station Name	30.01.2018			23.04.2018		
	EXP	ACT	%	EXP	ACT	%
Bellary TPS	11.39	12.96	114%	15.6	15.8	101%
Jindal	1.7	0	0%	44.8	9.1	20%
Kadra	0	0	Out	7.2	0.1	1%
Kodasalli	0	0	Out	3.8	0.1	3%
Nagjari	0	0	Out	5.8	-0.1	-2%
Raichur TPS	35	1	3%	41.2	15.6	38%
Sharavati	6.3	26.8	425%	8.4	41.3	492%
Sharavati Tail Race	0	0	Out	8.7	-0.1	-1%
UPCL	31.98	8.98	28%	37.7	2.8	7%
Varahi UGPH	1.2	2.4	200%	2.7	30.1	1115%
YTPS	0	0	Out	0	0	Out

- **Sharavathy, Varahi and Bellary stations were complimented for good RGMO performance.**
- KPCL agreed to look into the performance of the other units/stations.
- **Kar SLDC was requested to take up the issue of non-performance with the concerned generators.**
- UPCL informed that the performance on 23.04.2018 was less since generation was being ramped down.
- KPCL/KPTCL agreed to look into the RGMO status point extension at RTPS Unit IV (will be made available during R & M works), LDPH ( Extended upto SLDC to be configured) and Supa (yet to be carried out).

**15. Status of REMC Project**

- SR-II informed that site survey of control centres is completed and the control centre buildings of KPTCL were expected to be ready by October 2018. Database & display building is expected to be completed by August 2018 for the stations envisaged under the project (KAR-78). **Total commissioning is expected by Jan 2019.**

**16. PSS Tuning pending for Yeramarus and JSWEL Unit-IV**

- KPCL informed that the PSS tuning at Yeramarus would be carried out as and when generation is sustained. Protection issues at Yeramarus would be put up as an agenda item in the PCSC Meeting.
- KAR SLDC agreed to follow up PSS tuning for unit-IV of JSWEL.

**17. Functionality testing of backup SLDC**

- Functionality testing of backup SLDC needs to be done once in 6 months to ensure high availability of data/preparedness to operate from Back up CC in event of any contingency.
- GM, SRLDC pointed out that the functionality testing of backup SLDC needed to be carried out by all the SLDCs once in six months. The same exercise was being done for RLDCs periodically.
- SRLDC informed that there could be disruption in SCADA for about 9 minutes and the SRLDC webpage could be utilized during that period.
- **Karnataka SLDC agreed to complete the functionality testing of the backup Control Centers within a month.** SRLDC agreed to render necessary assistance in this regard.

**18. SEMs: SEMs at BTPS and UPCL (UPCL-Hassan lines)**

- KPCL agreed to provide the SEMs at BTPS.
- UPCL stated that both Main and Check meters at UPCL end of UPCL-Hassan lines as per CEA metering regulations were already provided and data was being communicated to Kar SLDC periodically.
- SRLDC informed that for pair checking, data from UPCL end was required in their format.

- UPCL agreed to coordinate with SRLDC and assured that this issue would get addressed. Subsequently, UPCL vide mail dated 10.07.2018 had informed that initially it was required to install 3<sup>rd</sup> meter apart from main and check meters. At Hassan both main and check meters are installed at interface metering points. Subsequently SRLDC had requested UPCL to share the \*.npc / encrypted data of existing meter installed by KPTCL. These meters are sealed by KPTCL RT division Mangalore. These meters are read every fortnight by KPTCL RT division Mangalore using CMRI. **Hence, same data would be uploaded to SRLDC web site every fortnight.**

#### **19. PLCC issues on 400 kV Guttur-Kaiga lines at Guttur S/S**

- KPTCL informed that the issue (as noted in Kaiga GS meeting) had been rectified.

#### **20. Data required by CEA**

- ***Data required for development of Geospatial Energy Map of India***

Data required (as per CEA letter dated 04.05.2018) for development of Geospatial Energy Map of India was to be furnished to CEA at email [cedpd-cea@gov.in](mailto:cedpd-cea@gov.in) by all the concerned entities latest by 31.05.2018. SLDCs were kindly requested to communicate the requirements to DISCOMs and other entities in the control area.

- KPTCL informed that the required data had already been communicated to CEA vide letter dated 05.06.2018 (**Annexure-VII**).
- Other entities were requested to furnish the required data to CEA.

- ***NPP data Portal***

CEA vide letter dated 26.06.2018 had requested all power utilities for providing data on NPP. All SLDCs were requested to direct the power utilities/stations under their purview for providing data on NPP.

- KPCL informed that the requisite information was being uploaded on NPP.
- KAR SLDC was requested to take up the issue with other power utilities / stations under their purview for providing data on NPP.

- ***RE data***

CEA vide letter dated 10.04.2018 had sought data on location of installed capacity of all current RE sources and location of anticipated RE installations in 2022.

- It was noted that KPCL had furnished the information.
- KPTCL was kindly requested to furnish the information sought by CEA. KPTCL agreed to furnish the sought information.

#### **21. Failure of OFC link in KPTCL system**

- SR-II informed that initially there was only one connectivity to SRLDC through NRS-A station KPTCL fibre link. Recently, an alternate route to SRLDC was commissioned through HAL-A station KPTCL fibre link. The link between HSR and A station is not yet commissioned due to failure of KPTCL fibre between NIMHANS and EDC. The fibre link between HAL and A station had failed due to fibre cut between HAL and

EDC (letter dated 10.07.2018 in this regard enclosed at **Annexure-VIII**). SR-II requested KPTCL to accord permission to carry out the rectification works.

- SRLDC expressed concern that only one link was available to SRLDC and requested KPTCL / SR-II to ensure the redundant path at the earliest.
- KPTCL agreed to concur for the maintenance works.
- Forum requested KPTCL to ensure the link between HSR and A station. Further, the fibre links of KPTCL being used for data transfer to SRLDC need to be maintained on high priority.

## **22. Conclusion**

MS, SRPC thanked all the participants for the active and fruitful deliberations. He hoped that the issues would get addressed in a time bound manner.

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