Annexure-B

GUIDELINES FOR PLANNING OF TELEMETRY AND VOICE COMUNICATION

1. The DAS/RTU to be installed at the power stations/substations/pooling station should have **IEC 60870-5-101or IEC 60870-5-104** protocol with interoperability matrix compatible with the SCADA system available at SLDC/Sub-LDC/backup SLDC.

2. The renewable generating Stations are required to arrange data channel upto nearest Control centre i.e. SLDC Jabalpur/Sub-LDC Indore/backup SLDC Bhopal or nearest wideband nodes. The existing wideband nodes are at 400KV S/s Bhopal,400KV S/s Indore,400KV S/s Bina,400KV S/s Nagda,400KV S/s Katni, 400KV SGTPS, 220KV S/s Ujjain, 220KV Itarsi, 220KV Damoh, 220KV S/s Jabalpur,220KV S/s Satna.

3. The Renewable Generators are required to provide pooling station wise and turbine wise / inverter wise telemetry along with whether parameters. The turbine wise/inverter wise telemetry (active and reactive power) along with active and reactive power of all feeders upto 33KV connected at pooling station/control centre, active and reactive power of transformers, bus voltage, frequency and circuit breaker status of all feeders, transformers, bus couplers of your pooling station/control centre, SOE upto 132KV elements of pooling station where DAS /RTU is located shall be provided by RE Generator. Further, telemetry of whether parameters like wind speed of each wind turbine, irradiation parameters, temperature, humidity, etc shall also required to be provided by RE generators.

4. The renewable generating stations are required to arrange reliable data channel using either Power Line Carrier Communication (PLCC), OPGW Communication, dedicated point to point leased line, VSAT communication or combination of these.

It may please be noted that communication channel using GPRS/GSM is not found reliable and suitable by SLDC,MPPTCL and hence shall not be permitted for telemetry. Further, data chanel using internet/broadband internet shall also not permitted due to cyber security reasons.

5. The measured mentioned above are required to be configured in RTU/DAS as IEC type detailed hereunder:-

S.N	Data object	IEC Data type to be configured
1.	Breaker Status	M_DP_TA_1 (TYP04) i.e Double status with time tag.
2.	Analog Input (MW, MVAR, KV, HZ)	M_ME_NA _1 (Type09) or M_ME_NC (TYPE 13)

6. The other important IEC 870-5-101 parameter setting required to be made in your DAS/RTU are also given hereunder

IecMaxUserFrameLength	**255**
IecLLAddrFieldLength	**1 octet**
IecASDUAddrFieldlength	**1 octet**
IECObject Addr Field length	**2 octet**
IEC Transmission Field length	**1 octet**

7. The various protocol parameters is required to be configured as given hereunder:-

Type of power system data	Data unit type	Description as per IEC	Data polling method	Scan group	Class-x	Object address range
Analog values	ASDU-9 or ASDU-13	Measured value normalized or short float	Periodic group scan	Group-3	Class-2	3001-4001
Single Input digital status	ASDU-1	Single Point information without time tag	By exception (spontaneous) and on periodic group scan	Group-1	Class-1 after exception, class-1 after group scan	1-1000
Single Input digital status	ASDU-2	Single Point information with time tag	By exception (spontaneous)	Group-1	Class-1 after exception	1001-2000

Digital Inputs Double point	ASDU-3	Double point information	By exception (spontaneous)	Group-2	Class1 after exception	2001-3001

8. The reliable data channel from DAS/RTU to nearest SLDC/Sub-LDC/wideband node (either PLCC or leased line) is required to be arranged by Your company. The data channel speed for IEC 60870-5-101 protocol may be worked out on the basis of Number of analog data as per details given hereunder:-

No. of Analog Data	Minimum Baud Rate
0 – 30	300
31 – 60	600
61 – above	1200

For IEC 60870-5-104 protocol data channel using OPGW/VAST/dedicated point to point leased line with Ethernet port at both the ends is required to be arranged. The IP address for RTU/Ethernet port shall be provided at the time of commissioning. Two Number FEP server IP address is to be configured in RTU for redundancy purpose.

Data is required to be updated at SLDC SCADA as and when it is changed at field. The data update rate from RTU at TSS to SLDC SCADA/EMS system for analog signal is required in less then 10 seconds and for status signal is required less then 4 second

9. As these renewable generating stations are located at remote stations, outage of telemetry due to non availability of backup auxiliary power supply is also observed. Hence, in order to ensure round the clock availability of telemetry, it is also required that the telemetry system shall be commissioned with UPS and battery of sufficient capacity so that power backup for at least 8 hours is available.

10. Modem/other integration equipment like VSAT terminal/OPGW terminal equipment/PLCC cabinets along with necessary wiring/cabling required for integration of telemetry of your plant at Sub-LDC /SLDC shall also be arranged by the concern renewable generating agency. In case of leased line/VAST communication arrangement

for renewable of leased charges is required to be made by renewable generating stations. The data base preparation in SLDC/backup SLDC/Sub-LDC SCADA system shall be arranged by SLDC.

11. The renewable generating stations are advised to obtain approval of telemetry scheme as well as data IO list before commissioning of telemetry so that compatibility issue with SLDC SCADA/EMS system, if any may be avoided.

12. Ensuring round the clock availability of telemetry after its commissioning is of utmost importance and necessary arrangement for ensuring 100% availability after sub sequent commissioning of telemetry like arrangement of sufficient spares for data channel as well as data acquisition equipment , AMC with OEMS, availability of backup of all configuration files, wiring diagram etc is required to be maintained and details of contact person responsible for maintenance of telemetry is required to be informed by each renewable generating stations to SLDC.

13. In order to ensure round the clock availability, it is required to install RTU/DAS/MFM/MODEMS of reputed make having type test certificate.

14. In any case, synchronization of renewable generating station without telemetry shall not be permitted.

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